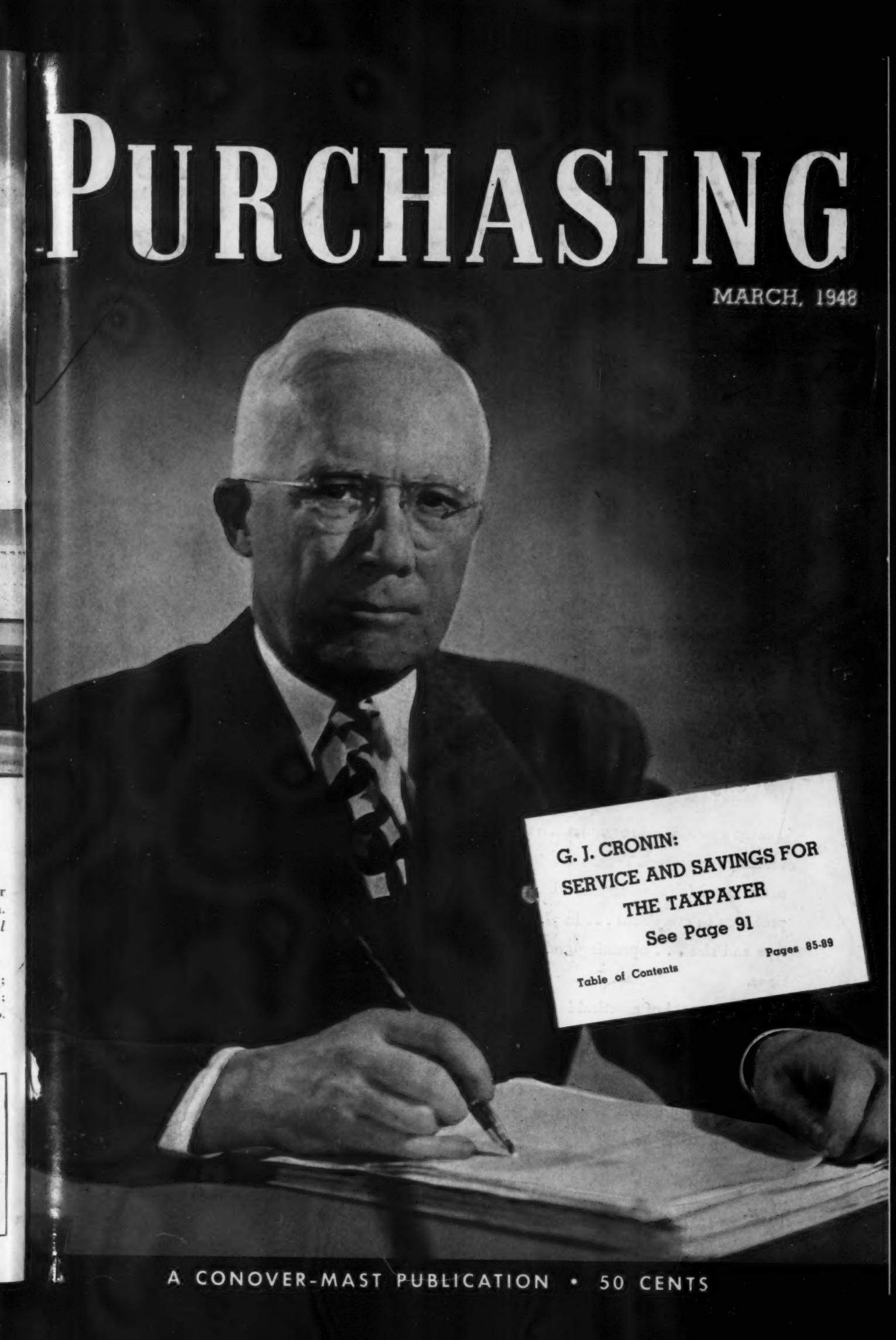
PURCHASING

MARCH, 1948



G. J. CRONIN:
SERVICE AND SAVINGS FOR THE TAXPAYER
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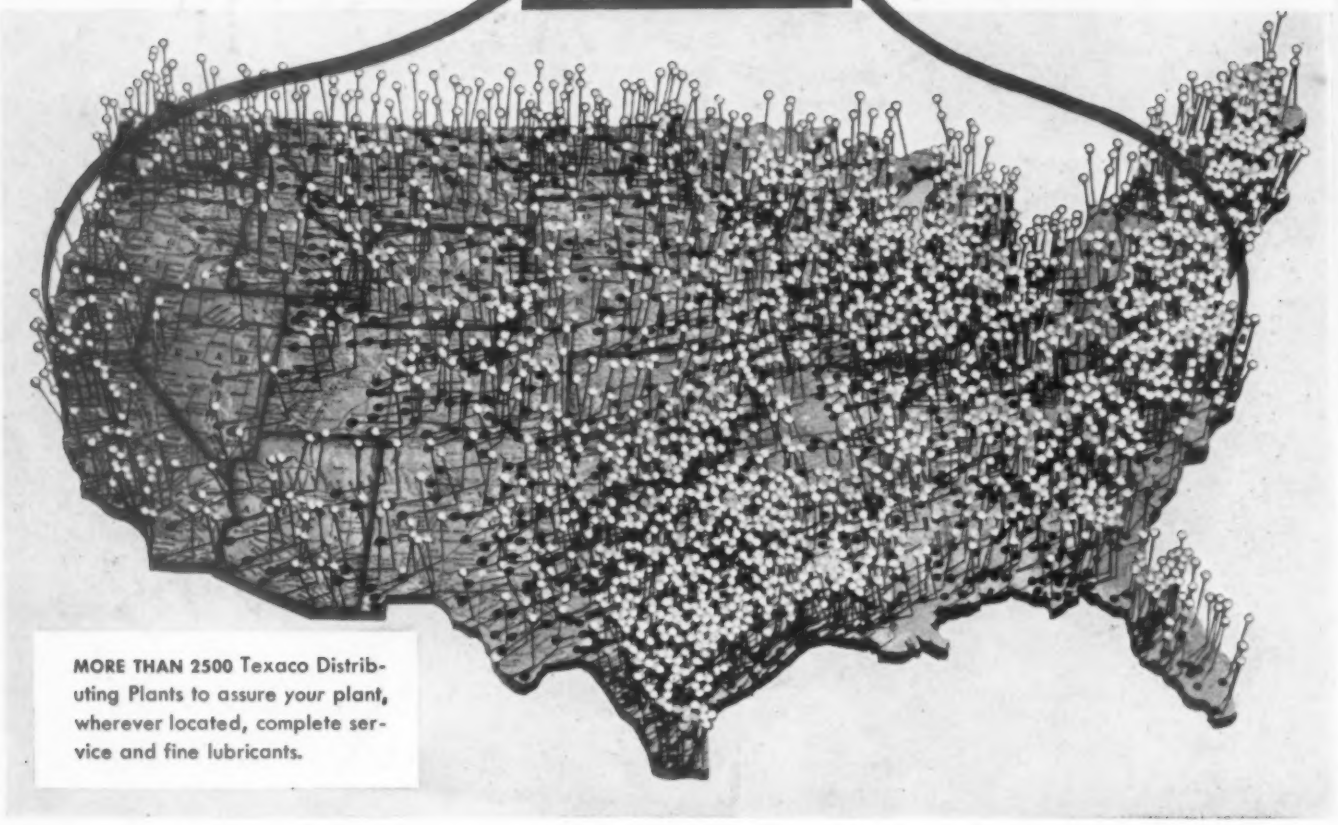
A CONOVER-MAST PUBLICATION • 50 CENTS

How Texaco's Nation-wide Service Benefits You



MORE THAN 2500 Texaco Distributing Plants to assure *your* plant, wherever located, complete service and fine lubricants.

Every pin marks a supply point for quality lubricants and for engineering experience to help you produce more at lower cost

Texaco's nation-wide organization works with industry everywhere. Texaco Lubrication Engineers are in intimate contact with production problems in every field . . . in plants of every type and size . . . operating under all conditions.

From the pool of practical information thus gathered, your Texaco Lubrication Engineer can draw on the combined experience of Texaco in all 48 States. He can serve you better . . . help you in many ways to achieve greater production at lower cost.

You can enjoy these Texaco benefits at no extra cost. Just call your local Texaco Distributing Plant, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

TEXACO

REG. T.M.

TEXACO Lubricants, Fuels and Lubrication Engineering Service

TUNE IN . . . TEXACO STAR THEATRE presents the TONY MARTIN SHOW every Sunday night. • METROPOLITAN OPERA broadcasts every Saturday afternoon.

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Illustrates Century 3 horsepower type RS and smaller motors.

Illustrates Century 7½ horsepower type RS motors.

Century Repulsion Start Induction Brush Lifting Single Phase Motors START HEAVY LOADS

Century Type RS motors are widely used to drive all kinds of motorized equipment wherever single phase power is distributed, particularly in suburban or farm districts. They have been satisfying owners for more than 43 years.

Because repulsion start motors have the highest starting torque per ampere of any single phase motor, they are ideal for equipment that must start under full load.

Century single phase motors are built in sizes up to 20 horsepower and other types in a wide range from 1/6 to 400 horsepower to provide top performance to meet every electric power application.

Specify Century for all your electric power requirements.

564

Century C MOTORS

CENTURY ELECTRIC COMPANY • 1806 Pine Street, • St. Louis 3, Missouri

Offices and Stock Points in Principal Cities

PURCHASING, published monthly by PEEAYE, INC., subsidiary of CONOVER-MAST PUBLICATIONS, INC. Publication Office, Orange, Conn. Editorial and Executive Offices 205 East 42nd St., New York 17, N. Y. Entered as second class matter August 8, 1942, at the Post Office in Orange, Conn., under the act of March 3, 1879. Subscription rates: United States: U. S. Possessions and Canada: $4 per year, $7 for two years; elsewhere $6 per year, $11 for two years. Single copies 50c. Volume XXIV, No. 3.

FELT SEALS RETAIN LUBRICANTS, EXCLUDE DUST

Two Basic Types of Felt Seals, Applicable in a Wide Variety of Designs, Solve Most Sealing and Packing Problems

The unusual and unique properties of felt make it especially valuable in sealing and packing applications. Such uses are increasing steadily, as more and more engineers and designers appreciate the simplicity of application, reliability of performance, and long life of felt. For any machines in which it is necessary to retain bearing lubricants, and feed them automatically and uniformly as needed, or from which dust, fumes or moisture must be excluded, felt seals and packings merit your consideration.

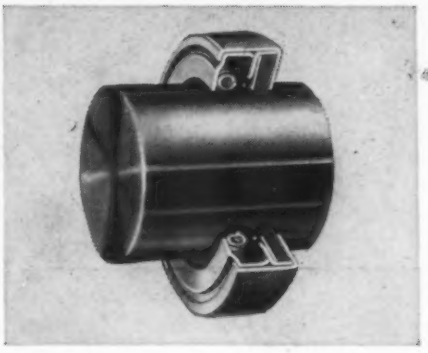
PHYSICAL CHARACTERISTICS

The chief physical characteristics of felt that make it so highly suitable for seals are absorption capacity, low coefficient of friction, and resiliency. Oil absorption capacity is high, and is largely a function of felt density. The coefficient of friction averages 0.22 for dry felt against steel, which is reduced to 0.15 when the felt is pre-saturated with oil of 41.2 Saybolt viscosity at 210°F. Because of its resilience, felt maintains a constant sealing pressure regardless of wear, end-play, minor mis-alignment or out-of-round conditions of metal shafts and assemblies. Felt seals will never fail through aging, embrittlement, or distintegration.

TWO TYPES OF SEALS

Plain Felt Seals. These are precision-cut washers, produced by American Felt Company, your cutter, or in your own plant, with a tolerance of .005". These are cut from standard types of S.A.E. Felt, and may be pre-saturated with lubricant before assembly. The lubricant employed is generally one higher in viscosity than that which is to be retained. Such seals have only two limitations: they should not be used to retain oil of extremely low viscosity, nor to retain pressurized lubricants. For such services, the laminated seal is recommended.

Laminated Felt Seals. In these, the plain felt seal is combined with one or more impervious septums of 1/64 to 1/32 inch sheet Hycar. The felt may be of the same density throughout, or felt of different densities may be used on opposite sides of a septum. Thus a laminated seal can have felt of high density and oil-retention capacity on one side, and on the other side a lower density felt for dust exclusion. An example of this is seen at (a) in the drawing, which shows a single-unit washer that combines lubricant-retention, sealing, and dust-exclusion. The impervious septum may also be on only one side of the washer, as in (b). The multiple laminations of (c) to (e) inclusive are further modifications, developed for progressively more difficult mechanical sealing operations.



IMPREGNANTS

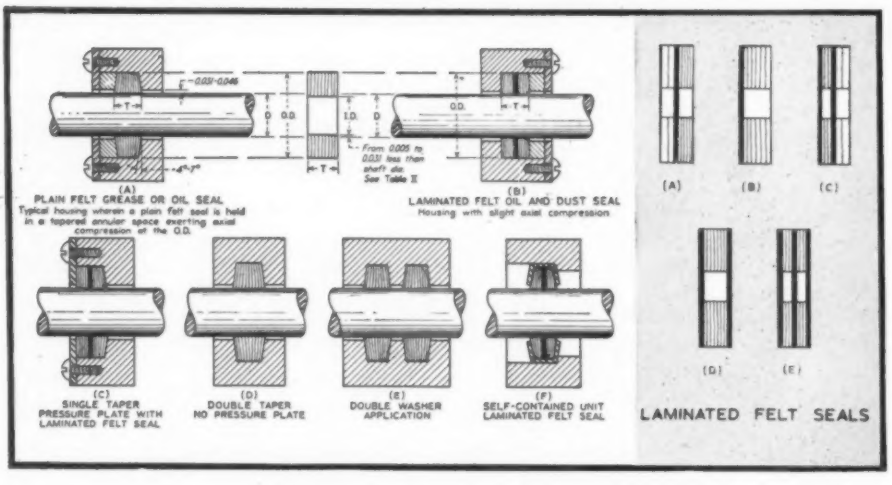
Both plain and laminated felt seals may be impregnated with standard grades of oils and greases, or special treatments may be used to meet unusual conditions.

SELECTION

Felt seals, plain or laminated, are recommended where operating temperatures lie between −60° and 250°F. and where peripheral shaft speeds do not exceed 2000 feet per minute. Since felt is an engineering material, thoroughly understood and standardized, selection of the proper type to meet any given conditions within the above range can be made with complete confidence.

COLLABORATION

American Felt Company engineers will gladly collaborate with you in design of seals and selection of the proper type of felt. The material in this advertisement is a condensation of data given in American Felt Company Data Sheet No. 11, "Felt Seals, Their Design and Application." This contains additional technical information, such as tables showing oil absorption capacity, and dimensional tolerances and degree of housing compression for plain and laminated felt seals. This eight-page Data Sheet is the outstanding paper on this subject. Write for it on your company letterhead.



American Felt Company

TRADE MARK

Engineering and Research Laboratories: Glenville, Conn.
PLANTS: Glenville Conn.; Franklin, Mass.; Newburgh, N. Y., Detroit, Mich.

SALES OFFICES: New York, Boston, Chicago, Detroit, Cleveland, St. Louis, Philadelphia, Atlanta, Rochester, Dallas, San Francisco, Los Angeles, Portland, Seattle, Montreal

The "SHOTGUN" ..... that helps give your car the NEW LOOK

(Above) Special machine for shot-blasting the rolls used in production of easy-to-draw Inland sheets, such as those being stamped into auto tops (right).

THE smooth-flowing lines of today's smart motor cars were made possible when Inland engineers developed the cold-rolled sheet *with the shot-blasted finish.*

This method of rolling steel with special shot-blasted rolls imparts a roughened surface to Inland sheets. The textured surface aids in the fabrication of deep-drawn parts, such as automobile tops and fenders. It holds the die lubricant, allows better control of slippage, requires less hold-down pressure, and helps prevent scoring.

The shot-blasted roll is just one of many Inland developments providing industry with steel to fit the job. INLAND STEEL CO., 38 S. Dearborn St., Chicago. Sales Offices: Chicago, Davenport, Detroit, Indianapolis, Kansas City, Milwaukee, New York, St. Louis, St. Paul.

INLAND STEEL ...*COLD-ROLLED SHEETS for Deep Drawing*

OTHER PRODUCTS: BARS • STRUCTURALS • PLATES • STRIP • TIN PLATE • FLOOR PLATE • REINFORCING BARS • RAILS • TRACK ACCESSORIES

Immediate shipments from stock of U·S·S Carilloy Steels

— manufactured to a Guaranteed Minimum Hardenability

IF you are a user of alloy steel, it is to your advantage to know that U·S·S Carilloy Steels in our stock are manufactured to a *Guaranteed Minimum Hardenability*.

And when you place an order with us for U·S·S Carilloy Steel you get an additional metallurgical service: *A Heat Treatment Guide which contains complete and specific information about the steel you receive is supplied you with each individual shipment.* This guide gives you *specific* data on the composition, potential physical properties and fabrication of the steel to help you obtain the maximum performance from the steel we furnish on your order.

In addition to these advantages, large and diversified stocks of U·S·S Carilloy Steel make it possible for us to serve your alloy requirements quickly. You are assured of reliable performance when you order alloy steels featuring *Guaranteed Minimum Hardenability*.

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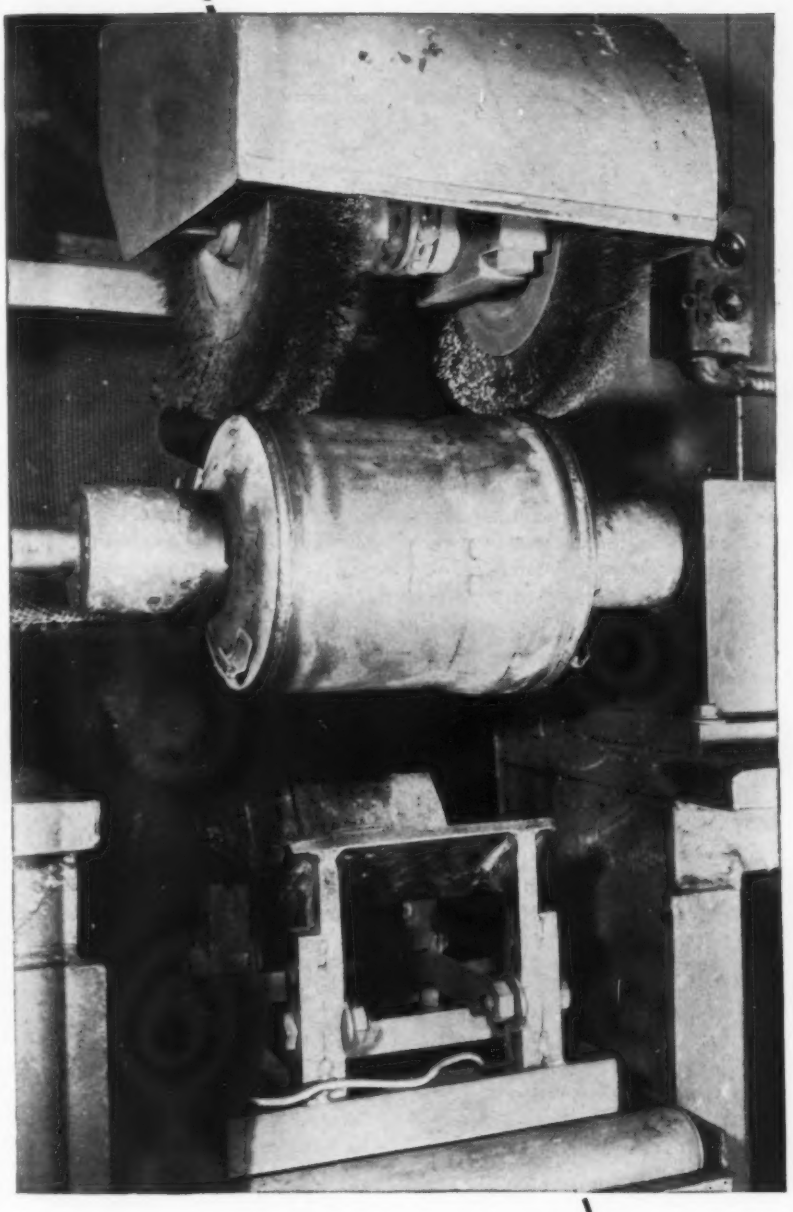
BALTIMORE (3)	Bush & Wicomico St., P. O. Box 2036	Gilmor 3100
BOSTON	176 Lincoln St., (Allston 34), P. O. Box 42	STadium 2-9400
CLEVELAND (14)	1394 East 39th St.	HEnderson 5750
LOS ANGELES (54)	2087 East Slauson Avenue P. O. Box 2826—Terminal Annex	LAfayette 0102
MILWAUKEE (1)	4027 West Scott St., P. O. Box 2045	MItchell 7500
NEWARK (1), N. J.	Foot of Bessemer St., P. O. Box 479	Bigelow 3-5920 REctor 2-6560—BErgen 3-1614
PITTSBURGH (12)	1281 Reedsdale St., N. S.	CEdar 7780
ST. LOUIS (3)	311 S. Sarah St., P. O. Box 2.	LUcas 0440
TWIN CITY	2545 University Ave., St. Paul (4), Minn.	NEstor 7311

UNITED STATES STEEL

OSBORN BRUSHES

WHISK AWAY WELD SCALE IN 40 SECONDS



Automatic brushing operation processes refrigerator compressor heads in record time.

IT'S a production job—cleaning weld scale from both ends of a refrigerator compressor head. It's an important job—trouble free, precision performance demands that every trace of this scale be removed.

Here's how it's done—fast, economically, thoroughly—in 40 seconds. The compressor head is first attached to a rotating fixture. Then two power driven Osborn Master Wire Wheel Brushes are lowered automatically into just the proper brushing position. Head revolves, wheels revolve and in 40 seconds a unit free from all weld scale is on its way to the next assembly station.

Simple? Sure. Just a matter of combining a little ingenuity with the right type of brush and the savings are all yours. Modern power brushing is piling up profits on dozens of jobs—cleaning, roughing, removing burrs, finishing, polishing.

Osborn's 56 years experience means more than just "know how" in building better brushes. There's a wealth of practical application ideas that are yours for the asking. An Osborn sales engineer will be glad to show you why brushes are one of today's most modern production tools. Write or call—

THE OSBORN MANUFACTURING COMPANY

5401 Hamilton Avenue Cleveland, Ohio

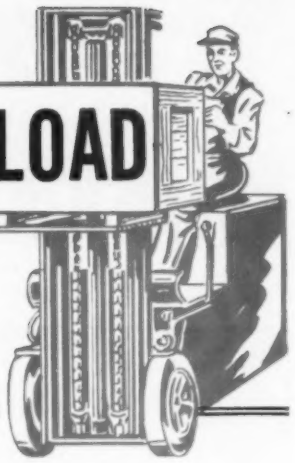
Osborn Brushes

WORLD'S LARGEST MANUFACTURERS OF BRUSHES FOR INDUSTRY

POWER DRIVEN BRUSHES • PAINT BRUSHES • MAINTENANCE BRUSHES

Your trucks will carry MORE PAY LOAD

when batteries are kept properly charged



with

FEDERAL'S NEW

INDUSTRIAL TRUCK BATTERY CHARGER

PROPER battery charging can cut your material handling costs two ways—by increasing load handling capacity and minimizing battery replacement. Batteries deliver *more power* and *last longer* when charged to the proper level—at the proper rate.

Federal's new Selenium Rectifier Industrial Truck Battery Charger is especially designed to provide positive automatic control of both charging time and charging rate. Lead cells are fully charged in 8 hours, starting at a high rate which automatically switches to low rate after reaching 85% charge. Edison type batteries are charged at a single high rate of automatically-controlled duration.

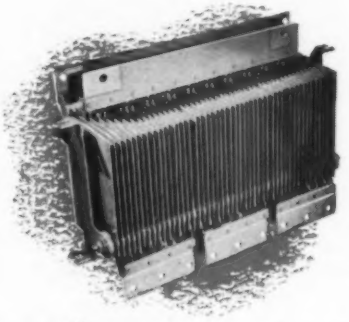
The addition of Federal's Automatic Recycling Control permits *two* batteries to be charged consecutively with a single setting of the controls.

Federal chargers are available in standard sizes to cover practically all industrial truck charging requirements—lead batteries of 150 AH to 1000 AH capacity and Edison batteries of 150 AH to 850 AH capacity. Write Federal today for complete information. Dept. E234.

- **DUAL-PURPOSE CHARGING**
  One unit charges either lead or Edison cells—with 2-rate charge for lead type and single-rate controlled duration charge for Edison type batteries.
- **AUTOMATIC OPERATION**
  Timing and charging rates are automatically controlled for the entire 8-hour charging period.
- **AUTOMATIC RECYCLING CONTROL**
  Federal's Automatic Recycling Control, for charging *two* batteries consecutively in 16 hours, is available for all standard chargers.
- **SIMPLIFIED CONTROLS**
  Charger can be operated by truck drivers or other unskilled help. The operator makes the setting—the charger does the "thinking"

POWERED BY FEDERAL'S LONG LIFE SELENIUM RECTIFIER

Federal Selenium Rectifiers are instant starting, quiet in operation, last almost indefinitely without attention—and their inherent high efficiency keeps power bills to the minimum.



KEEPING FEDERAL YEARS AHEAD... is IT&T's world-wide research and engineering organization, of which the Federal Telecommunication Laboratories, Nutley, N. J., is a unit.

Federal Telephone and Radio Corporation

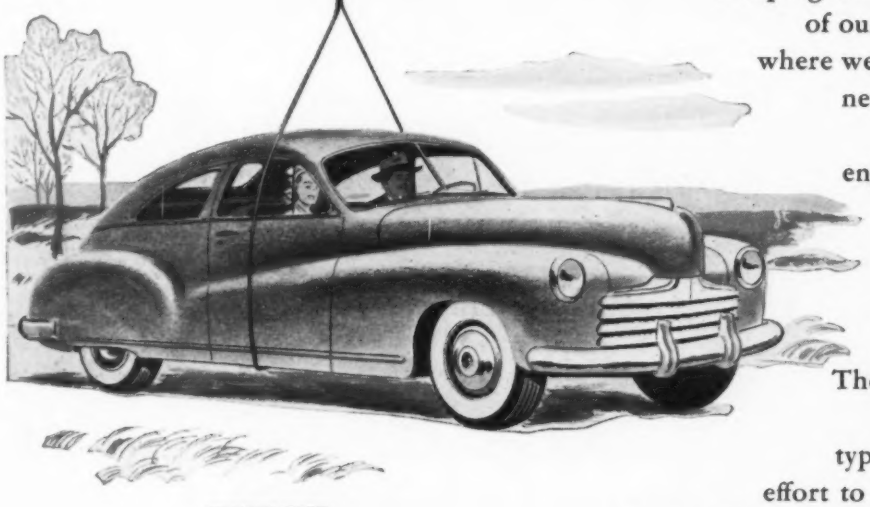
SELENIUM and INTELIN DIVISION, 1000 Passaic Ave., East Newark, New Jersey

In Canada:—Federal Electric Manufacturing Company, Ltd., Montreal, P. Q.
Export Distributors:—International Standard Electric Corp. 67 Broad St., N. Y.

How wire keeps your car up on its toes

ALL automobile tires have one thing in common—steel wire imbedded in their beads. Without it, car weight and the tremendous pressures caused by speed, bumps and rounding corners would stretch the beads, forcing the tires off the rims. So wire actually keeps your car up on its toes, withstanding pressure and shock, anchoring your tires safely and securely.

Sounds simple. But many problems confront the tire engineers—problems of wire strength, endurance, flexibility, position, spacing, adhesion, insulation and others. Yet today you know that if you give your modern tire only reasonable care its bead will *never* let you down.



Keeping cars on their toes has for years been part of our business at National-Standard. Here, where we develop and produce the special wire needed in various forms for tires and all other wire-in-rubber products, our engineers and laboratories work closely with the men who design and build tires, helping solve every problem of tire construction. Not only in America but throughout the world.

The perfection of tire beads, the virtually 100% elimination of bead failure, is typical of the tire industry's continuing effort to give you always better, safer, longer-lasting tires at ever lower cost.

NS
NATIONAL-STANDARD Company
NILES, MICHIGAN

DIVISIONS OF NATIONAL-STANDARD CO.

ATHENIA STEEL.. *Clifton, N. J.*	Flat, High Carbon, Cold Rolled Spring Steel
NATIONAL-STANDARD.. *Niles, Mich.*	Tire Wire, Fabricated Braids and Tape
WAGNER LITHO MACHINERY.. *Jersey City, N. J.*	Lithographing and Special Machinery
WORCESTER WIRE WORKS.. *Worcester, Mass.*	Round Steel Wire, Small Sizes

Every step in handling—from your production line by truck, train, ship, or plane to the retailer and consumer is a challenge to the container that protects your product.

Gaylord correct functional design, better materials, and precision manufacturing provide that vital *extra margin* of safety.

Call or write the nearest office.

- Corrugated and Solid Fibre Boxes
- Folding Cartons
- Kraft Grocery Bags and Sacks
- Kraft Paper and Specialties

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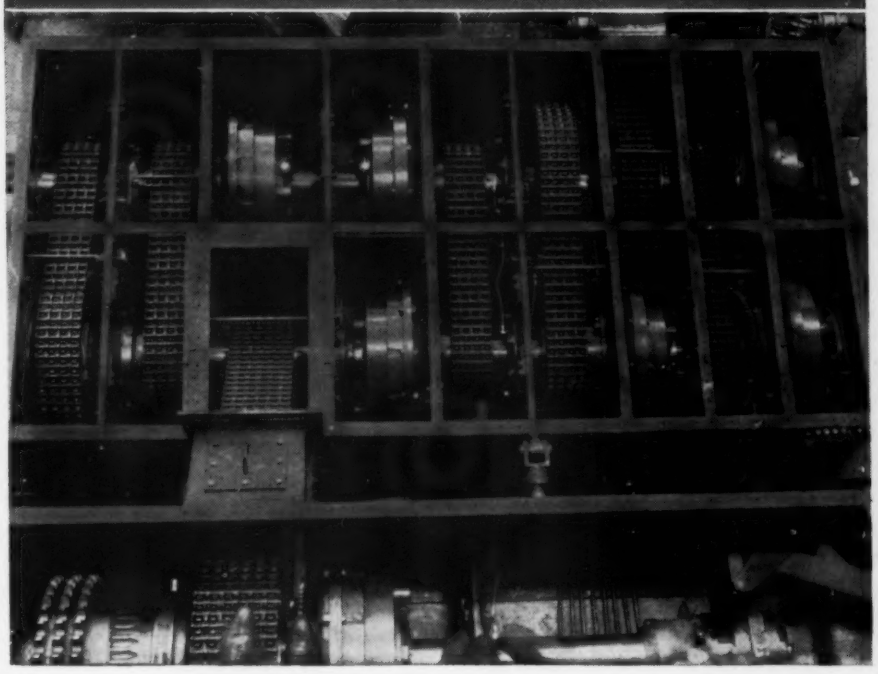
THE COMPLETE LINE OF LINK-BELT POWER TRANSMISSION MACHINERY

For Efficiency . . . *and Long Life* . . .



LINK-BELT *Silverlink* ROLLER CHAIN

Performance on every type of equipment and in every industry proves the high quality of Link-Belt Silverlink Roller Chain, incorporating the "know-how" of the world's leading producer of chain. Great strength in relation to weight, stamina to withstand shock loads, and smooth, positive, flexible operation are reasons for choosing Link-Belt Silverlink for the widest variety of conveying and power transmission functions.

It assures positive application of power which means perfect timing and coordination of machine operations. Shafts in any number, in any arrangement, can be given either direction of rotation, on long or short centers.

From the smallest size to the largest, it is a precision product. Furnished to manufacturers' (A.S.A.) standard sizes in single and multiple widths, to meet all requirements.

Let Link-Belt chain specialists aid you in applying Link-Belt Silverlink, where efficiency and long life count, for power transmission or conveying.

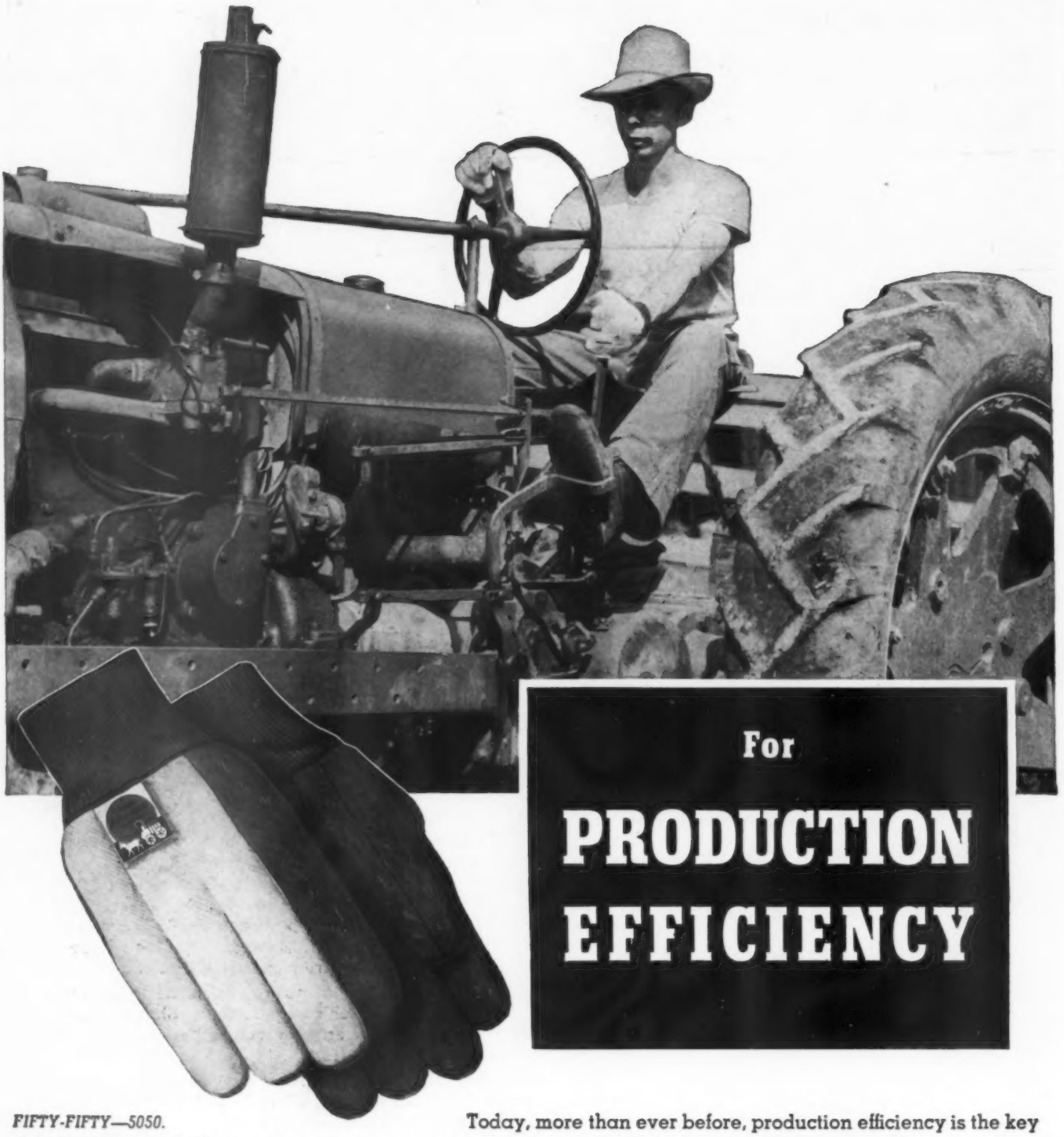
LINK-BELT COMPANY

Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Dallas 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8.
Offices, Factory Branch Stores and Distributors in Principal Cities.

10,953

LINK-BELT

Power Transmission Machinery



For PRODUCTION EFFICIENCY

FIFTY-FIFTY—5050.
A heavy-duty work glove with thick double-ply palms, ideal for farmers, millworkers and oil men.

Today, more than ever before, production efficiency is the key to profits . . . and this applies to the farmer and the "little fellow" as well as to "big business". Better work gloves help to promote better production efficiency, for skilled hands that can work in comfort with full protection can do a better job.

Riegel's WAGON BRAND Work Gloves are the best you can buy . . . comfortable, durable and economical . . . qualities that are made possible by complete Riegel control in one plant, from the raw cotton to the finished glove.

To get "The Right Glove for Every Job", specify Riegel's WAGON BRAND.

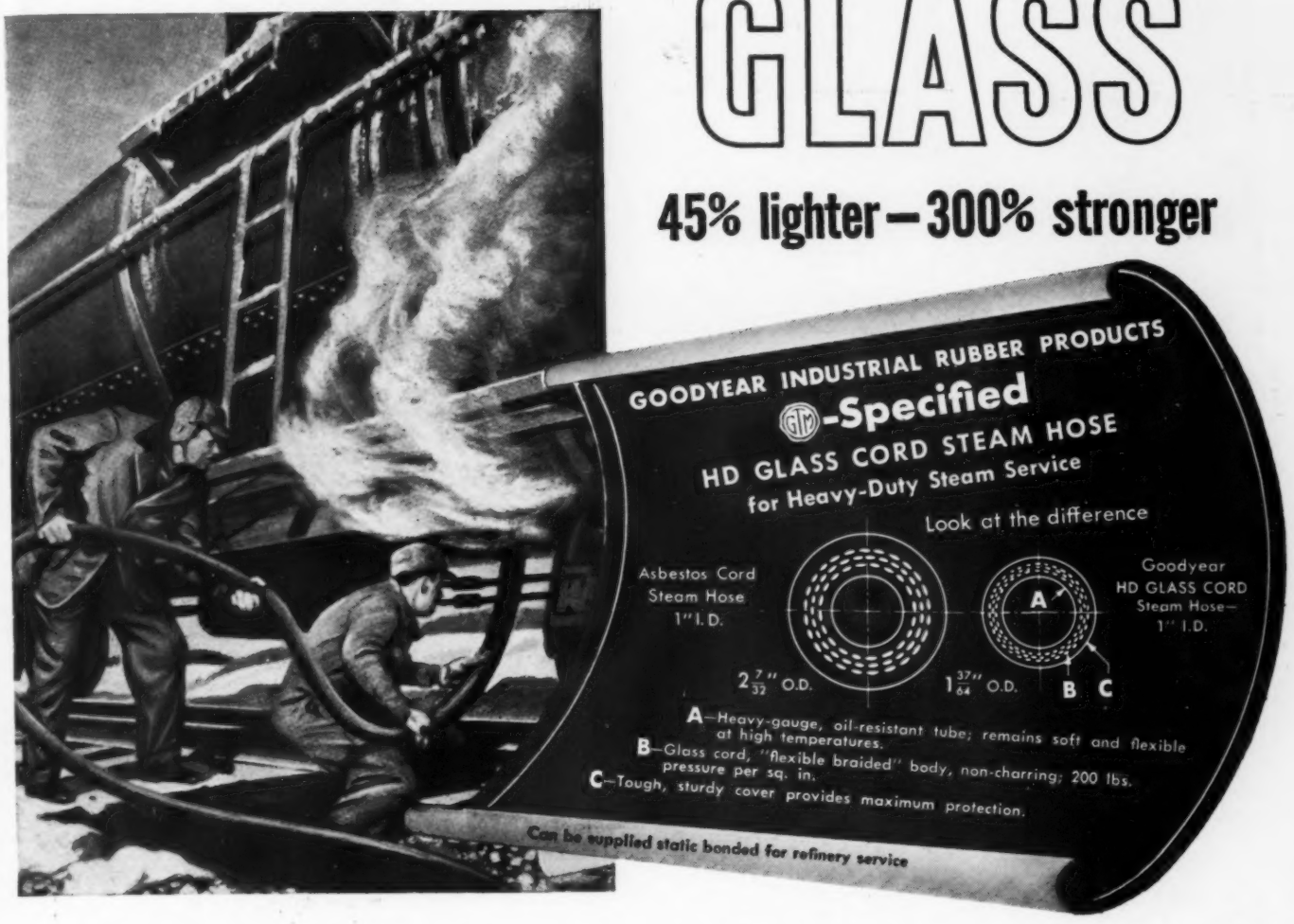
Riegel WAGON BRAND WORK GLOVES

Riegel WORK GLOVES

RIEGEL TEXTILE CORPORATION 342 Madison Ave., New York 17, N. Y.

NOW STEAM HOSE built with GLASS

45% lighter—300% stronger


GOODYEAR INDUSTRIAL RUBBER PRODUCTS
G.T.M.-Specified
HD GLASS CORD STEAM HOSE
for Heavy-Duty Steam Service
Look at the difference
Asbestos Cord Steam Hose 1" I.D.
Goodyear HD GLASS CORD Steam Hose— 1" I.D.
2 7/32" O.D.
1 37/64" O.D.
A
B C
A—Heavy-gauge, oil-resistant tube; remains soft and flexible at high temperatures.
B—Glass cord, "flexible braided" body, non-charring; 200 lbs. pressure per sq. in.
C—Tough, sturdy cover provides maximum protection.
Can be supplied static bonded for refinery service

Proved in service — now after more than a year of rigorous field tests Goodyear announces a revolutionary new type of steam hose that sets a new high in flexibility, ease of handling and long life. It is sinewed with *glass* fiber cord — a new development spun from silk-like filaments of glass, far superior to conventional materials in strength and heat resistance. The result is the finest hose ever offered for mill and foundry service, steam hammers, boiler cleaning, car thawing and other high-pressure steam uses.

What it does — this new Goodyear HD GLASS Cord Steam Hose has proved its ability to carry 200 pounds saturated steam pressure at 388° F. for more than 300 hours under constant flexing. If flexion is slight or use intermittent it will give far longer service. In field use it has lasted months where the best previous hose burst in weeks.

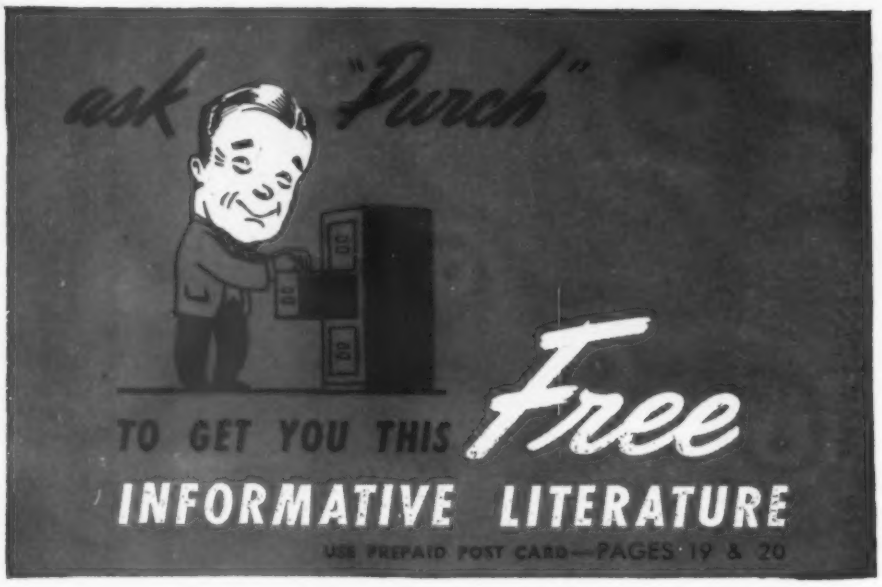
Compare these facts—size for size, this new Goodyear HD GLASS Cord Hose averages 45% less weight and 50% thinner wall gauge than former "beefed-up" types of asbestos cord hose — *yet it is 300% stronger!* The secret is the glass cord's higher tensile strength and an exclusive new Goodyear "flexible-braided" body construction that gives far greater adhesion, more brawn with less bulk.

How to order — see the G.T.M. — Goodyear Technical Man. Or phone your nearest Goodyear Industrial Rubber Products Distributor, local headquarters for hose, belting, molded goods, packing and tank lining built to the world's highest quality standard.

GOODYEAR

THE GREATEST NAME IN RUBBER

1898 GOODYEAR 50 YEARS 1948



☐ **1. ROPE**—Brand new Rope Booklet, 36 pages, which contains a lot of useful everyday information about rope—splicing, knots, how to rig block and tackle, and a weight and strength chart to aid in selecting proper rope size, is available from American Manufacturing Co. Name of book is American Brand Cordage.

☐ **2. QUALITY CONTROL**—A live subject—"The Statistical Method for Control of Quality" with explanation of the Hunter Quality Control Service, is available from the Hunter Pressed Steel Co. Say how many copies you want.

☐ **3. LIGHT METAL FABRICATION**—If your product uses sheet aluminum, magnesium or stainless steel, booklet "Points to Check When Selecting a Sheet Metal Fabricator" supplies practical information of substantial value to buyers and designers. Colgate Manufacturing Corp.

☐ **4. PENDAFLEX FILING**—This is the filing system that makes for ease and simplification by use of the hanging folders. Cuts filing time and helps eliminate misfiling. Get copy of catalog describing the Pendaflex. Oxford Filing Supply Co.

☐ **5. STOCK HEADS**—Lukens flanged and dished heads, both standard and ASME—4" to over 14' in diameter, are subject of "Heads in a Hurry". List shows sizes and gages of carbon steel heads regularly stocked. Lukens Steel Co.

☐ **6. AIR CONDITIONING, Industrial**—New GE book "New Industrial Dimensions" tells about speeding up production and cutting costs with air conditioning and refrigeration equipment, and GE heat transfer equipment. Booklet describes 17 important applications, and gives photos and diagrams of basic heat transfer methods. General Electric Co., Air Conditioning Dept.

☐ **7. PLUG-IN BUSWAYS**—Bulletin describes the Trumbull Flex-A-Power plug-in busways. Convenient plug-ins every 12" permit plug-ins right at the load. Flex-A-Power is stocked in standard 10' lengths, 250 to 1000 amp. Trumbull Electric Mfg. Co.

☐ **8. LAMINATED PLASTICS**—Bulletin G-E Textolite Laminated Plastics, lists grades, properties, fabricating instructions and detailed information about the five forms of Textolite—sheets, tubes, rods, fabricated parts, molded-laminated parts, post-formed laminates, and low-pressure molded parts. Plastics Division, Chemical Dept., General Electric Co.

☐ **9. ELECTRODES**—General Purpose electrodes that are said to meet about 61% of all general purpose, mild steel welding requirements on production lines or special jobs, are the subject of Airco Electrode Catalog No. 120A. Air Reduction.

☐ **10. MAINTENANCE PRODUCTS**—Cleaners, waxes, polishing materials, insecticides, furniture polish, hand soaps, oil potash soaps, etc., are the subject of Catalog and Whiz-Off Manual covering chemical maintenance products for industrial and institutional use, available from R. M. Hollingshead Corp.

☐ **11. TAGS, LABELS, SEALS**—Booklet illustrates a myriad of labels and seals, shipping tags, informative tags, production tags, pin tickets, gummed labels, and also paper napkins and display material. Chart shows data wanted by consumers on tags and labels for 24 commodity groups. The Reyburn Manufacturing Co., Inc.

☐ **12. HAND BROACHING**—Bulletin describes "Minute Man" keyway broaches and sets for sixty second hand broaching of any size and depth keyway in any piece of work. The du Mont Corp.

☐ **13. COMPOSITE MATERIALS**—Strip Stock and wire. Products include overlay, inlay, edgelay, centerlay and thrulay material; gold, silver and platinum on wide variety of ferrous and non-ferrous metals, copper on monel, nickel, steel and beryllium copper, and nickel on beryllium copper and copper alloys. Suggested uses and applications are listed—brush holder springs, jewelry chains, contactors, connectors and switch blades, optical parts, fuse clips, watch bases, etc. The H. A. Wilson Co.

☐ **14. STAINLESS STEELS, Machining**—Booklet of 38 pages "Machining of Armco Stainless Steels" gives complete information on cutting rates and tool composition for each grade of stainless steel. It also gives hints for correct grinding, milling and drilling. Cutting fluids and other related subjects are also covered. The American Rolling Mill Co.

☐ **15. BOLTS, NUTS, SCREWS, Rivets, Washers**—New Catalog—130 pages, handily classified into six sections for various types of fasteners, and a miscellaneous section on anchors, pins, toggles, turnbuckles, etc., is now available from Sterling Bolt Co.

☐ **16. VIBRATION CONTROL**—Four felts are employed for vibration isolation. Full information regarding them plus complete technical data, will be found in American Felt Company data sheet No. 10, with sample folder.

☐ **17. ESTER GUMS**—Resin News for October, Volume XV, published by U. S. Industrial Chemicals, Inc., 146 pages, plastic bound, details U.S.I. Resins which trade usage has indicated to be the best for each purpose. In most cases an entire page is devoted to each resin. Sections cover ester gums, Arochem resins, Arofene resins, Congo resins, Aroplaz resins, testing methods, and natural resins.

☐ **18. GRINDER**—G-3 Grinder for more efficient small tool grinding, which is also adaptable for deburring, buffing, polishing and numerous special applications, is the subject of bulletin issued by the Corlett-Turner Co.

☐ **19. STAMPING MANUFACTURERS**—New (fourth) edition of the Blue Book of Stamping Manufacturers has been issued by the Pressed Metal Institute. It lists members geographically, gives information on their facilities, and is available without cost. Pressed Metal Institute.

☐ **20. SEAT VALVES**—Catalog 12-G6 describes Intex and Univalves, integral seat valves in forged steel chrome molybdenum. Univalves are welded bonnet integral seat valves for service at 1500 and 2500 lb. at 1000 F. Intex valves are bolted bonnet integral seat valves rated at 1500 lb., 1000 F. Edward Valves, Inc.

☐ **21. VOLTAGE REGULATORS**—Outdoor, self-cooled, 3-phase, 60-cycle, Type AFR feeder voltage regulator, in standard ratings of plus-minus 10% load ratio control in 38⅛% steps are described in new 24-page bulletin released by Allis Chalmers.

☐ **22. LABORATORY SHAKER**—Bulletin 207 describes The Burrell "Wrist-Action" shaker, designed for general laboratory use, which simulates the snap of the wrist, creating a swirling splash. It is furnished in 3 sizes—8 flask, 12 flask, and 16 flask. Burrell Technical Supply Co.

☐ **23. BUSINESS CHART, Long-Range**—1948 edition of its long-range business chart is now available from Ex-Cello-Corporation.

(*Please turn to page* 16)

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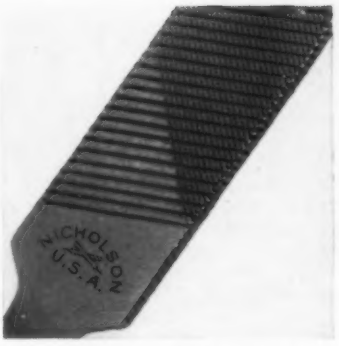
"KNOW YOUR FILES and CUT COSTS"

It's the cost of the workman's time that counts in filing operations. This is one of a series of advertisements on special-purpose files. Save it for shop and purchasing reference.

Subject: FILES FOR ALUMINUM — **Prepared by Nicholson File Co.**



"Type A" Aluminum File

Flat Bastard File

Filing Aluminum

WHY ALUMINUM REQUIRES A SPECIAL FILE. Aluminum is a soft, ductile, malleable metal and any cutting tool used on it has a tendency to build up chips before it. This is likely to dull the tool. The difficulty in filing soft aluminum with a regular purpose file is that the teeth are soon clogged unless very light pressure is used.

CONSTRUCTION OF ALUMINUM FILE. After much study and practical testing, Nicholson has produced the "Type A" Aluminum File which is specially designed for filing aluminum and aluminum alloy castings. This file has a fine overcut and a deep upcut. The fine overcut produces on the upcut a succession of small scallops which break up the filings and enable the file to clear itself of chips. The open-throat construction also tends to prevent clogging of the file. The light overcut reduces "chatter" by preventing the teeth taking too large bites.

USE OF ALUMINUM FILE. Nicholson and Black Diamond "Type A" Aluminum Files are designed to cut aluminum rapidly and without clogging, but to leave a somewhat better finish than the coarser special files for aluminum. They should be used on work where quick removal of stock is more important than finish; however, by filing with a shearing action toward the left a good finish can easily be made.

In some cases, such as with harder aluminum or aluminum alloy castings, regular Flat Bastard Files are often satisfactory; but wherever these have a tendency to clog, the special-purpose "Type A" Aluminum File should be used.

Nicholson and Black Diamond "Type A" Aluminum Files are available through your industrial supply house. They come in Flat and Half Round shapes, 6" to 14" in length, and all in one degree of coarseness.

Nicholson makes special-purpose files for Brass, Lead, Aluminum, Stainless Steel, Foundry Castings, Die Castings, Die Making, Lathe Filing, Curved and Shear Tooth Filing—and Swiss Pattern Files of all shapes and sizes.

FREE BOOK—*"FILE FILOSOPHY."*

NICHOLSON FILE CO., 28 Acorn St., Providence 1, Rhode Island
(In Canada, Port Hope, Ont.)

NICHOLSON FILES FOR EVERY PURPOSE

(*Continued from page* 14)

☐ **24. WATER COLUMNS & Gages**—Bulletin WG-1811 describes Yarway water columns and gages, and the Hi-Lo alarm mechanism. Gages are made in two classes, the vertical and the Sesure-Inclined. Former are available for pressures up to 2500#; inclined for pressures up to 400#. Yarnall-Waring Co.

☐ **25. PLATING BARRELS**—Bulletin P8-107 covers wide range of plating barrels, Mercil type, from the small single-unit jeweler's apparatus to the large multiple-unit production installation. Hanson-Van Winkle-Munning Co.

☐ **26. TIMING MOTORS**—New 16-page, 2-color catalog covers synchronous timing motors, timing devices and clock movements produced by the Hayden Manufacturing Co., Inc.

☐ **27. STEAM TURBINES**—8-page booklet covers solid rotor type steam turbine. It is complete with illustrations, engineering drawings and dimensional data. The Whiton Machine Co.

☐ **28. STEAM JET EJECTORS**—Steam jet ejectors for vacuum service and vacuum refrigeration are subject of catalog No. 1462; 36 pages, 30 sectional drawings, also flow diagrams, engineering data, installation guide, formulae, curves and tables. C. H. Wheeler Mfg. Co.

☐ **29. DIE CASTING MACHINES**—New smaller capacity die casting machines for both zinc and aluminum alloys are the subject of Bulletin 4806-A issued by the Hydraulic Press Mfg. Co.

☐ **30. TANTALUM**—"The Metal Tantalum", is title of 20-page booklet which gives the physical, chemical and electrical properties of Tantalum. Workability, weldability, machinability and fabricating techniques are discussed. Fansteel Metallurgical Corp.

☐ **31. VARIABLE PITCH PULLEYS**—Roto-Cone variable speed pulleys are the subject of Catalog 647, which are said to combine efficiency, versatility, simplicity and durability. HP ratings from ⅛ to 7½ are now available. Mounting may be either vertical or horizontal. All sizes deliver infinite speed variations within a 3 to 1 ratio except the ⅛HP which is 2¼ to 1. Gerbing Mfg. Corp.

☐ **32. EMERY FOR Concrete Floors**—Bulletin 701 tells about the use of natural emery as an aggregate for concrete floors. It gives recommendations of leading cement companies for good aggregate and shows comparative strength analysis. Walter Maguire Co., Inc.

☐ **33. PRECISION CASTINGS**—Carbon and Stainless Steel Precision Castings are the subject of bulletin just issued by Michigan Steel Casting Co. Materials include carbon and low alloy content steels as well as the highly alloyed stainless steels. Book is dedicated to Purchasing Executives and technical personnel.

☐ **34. METAL SURFACE PROTECTION**—Bulletin describes "Dum Dum for Metal" which provides a tough but elastic and pliable weather resistant, water repellant coating for use on new or uncoated metal structures which seals out measurable moisture, vapor and chemical gases and fumes. The Arco Co.

☐ **35. SEPARATOR**—The Air-Float Separator for the dry concentration of ores, minerals and other industrial materials is subject of bulletin issued by Sutton, Steele & Steele, Inc. It is said to produce a higher grade product with less loss; may be located anywhere, and will successfully treat ores which are not amenable to wet table concentration.

☐ **36. LABORATORY APPARATUS**—Hotpack laboratory apparatus are subject of new bulletin. Line includes sterilizers, high temperature furnaces, water stills, drying ovens, constant temperature baths, bacteriological incubators, preheating ovens, etc. The Electric Hotpack Co., Inc.

☐ **37. DISC GRINDERS**—Double spindle production disc grinders are the subject of bulletin 647-1. The method is for finishing opposite faces flat and parallel simultaneously. Company makes 6 sizes, 10" to 30" disc wheel capacity. Wet grinding systems provided for all grinders. Hanchett Manufacturing Co.

☐ **38. SAMPLE CASES**—Circular illustrates assortment of sample cases made by the William Bal Corporation. Cases are made of leather, canvas, vulcanized fibre and artificial leather fabric. Company also makes service and repairmen's kits.

☐ **39. METALLIZING AIR GUN**—Bulletin describes light duty, low-air metallizing gun which requires but ten cubic feet of air per minute for metallizing. Gun has turbine construction requiring but 1/3rd the power, making large compressor unnecessary, and requires but one adjustment for the entire range of metallizing wires. Gun weighs 4 lbs. 2 oz. Metallizing Engineering Co., Inc.

☐ **40. JIG**—New clamping jig known as the Cone-Lok jig is subject of Catalog 46-J. It utilizes the braking power of mated male and female cones. Three styles include the three-post, the up-clamp, and the bridge type. All can be converted from right to left hand operation quickly. Double locking feature provides maximum protection against accidents. N. A. Woodsworth Co.

☐ **41. RED DEVIL TOOLS**—1948 catalog No. 19 of 64 pages covering painters' and glaziers' tools and many hardware specialties and machines is now available. Specialties include floor polisher and electric fencers. Red Devil Tools.

☐ **42. ELECTRIC FORK TRUCK**—Six-page bulletin illustrates and describes the new Crescent Electric Palletier Model MGVH in 3,000 and 4,000-lb. capacities. Includes charts of load lengths for each capacity, dimensional drawings and complete specifications.

☐ **43. WIRE CLOTH**—Bulletin of 4 pages covers line of woven wire cloth, metallic filter cloth, metallic bolting cloth, fabricated wire parts, ASTM testing sieves and testing sieve shaker. Newark Wire Cloth Co.

☐ **44. CAPACITORS**—New catalog No. 200 is handy reference book and complete capacitor listing; 24 pages illustrated with detail drawings as well as halftones of more than 20 classes of capacitors which are described in detail. Cornell-Dubilier Electric Corp.

☐ **45. CIRCULAR METAL SAWS**—Triple chip circular sawing machines are the subject of bulletin of 16 pp; method is said to make for phenomenal speeds and accuracy. Circular sawing is characterized as being perhaps the most practical and economical method for cutting of metal to length. The Motch & Merryweather Machinery Co.

☐ **46. OIL COUNTRY GAGES**—This is brand new piece of literature giving latest information on P&W tools; company states gages are closely tied in with the American Petroleum Institute's standardization program. Pratt & Whitney Divn., Niles-Bement-Pond Co.

☐ **47. VIBRATING PROCESS EQUIPMENT**—Electric vibrating process equipment—dryers, coolers, packing tables, conveyors and auxiliary equipment are the subject of Catalog 804 just issued by The Jeffrey Manufacturing Co.

☐ **48. CLAD METALS**—SuVeneer clad strip steels are the subject of 4-page bulletin published by Superior Steel Corp. SuVeneer clad metal is low carbon strip steel clad inseparably on one or both sides with solid copper, monel or nickel. Bulletin explains qualities and applications.

☐ **49. ASSEMBLY LINE Gluing**—Bulletin describes Baystix wood glues which are said to make for extra speed, extra strength, and extra uniformity. Baystix does not require blending or heating, grabs quickly and has unlimited pot life. Bay State Adhesive Corp.

☐ **50. FANS**—Axiflo fans suitable for high temperature applications are the subject of 8-pp color booklet B-3804 which describes

(*Please turn to page* 19)

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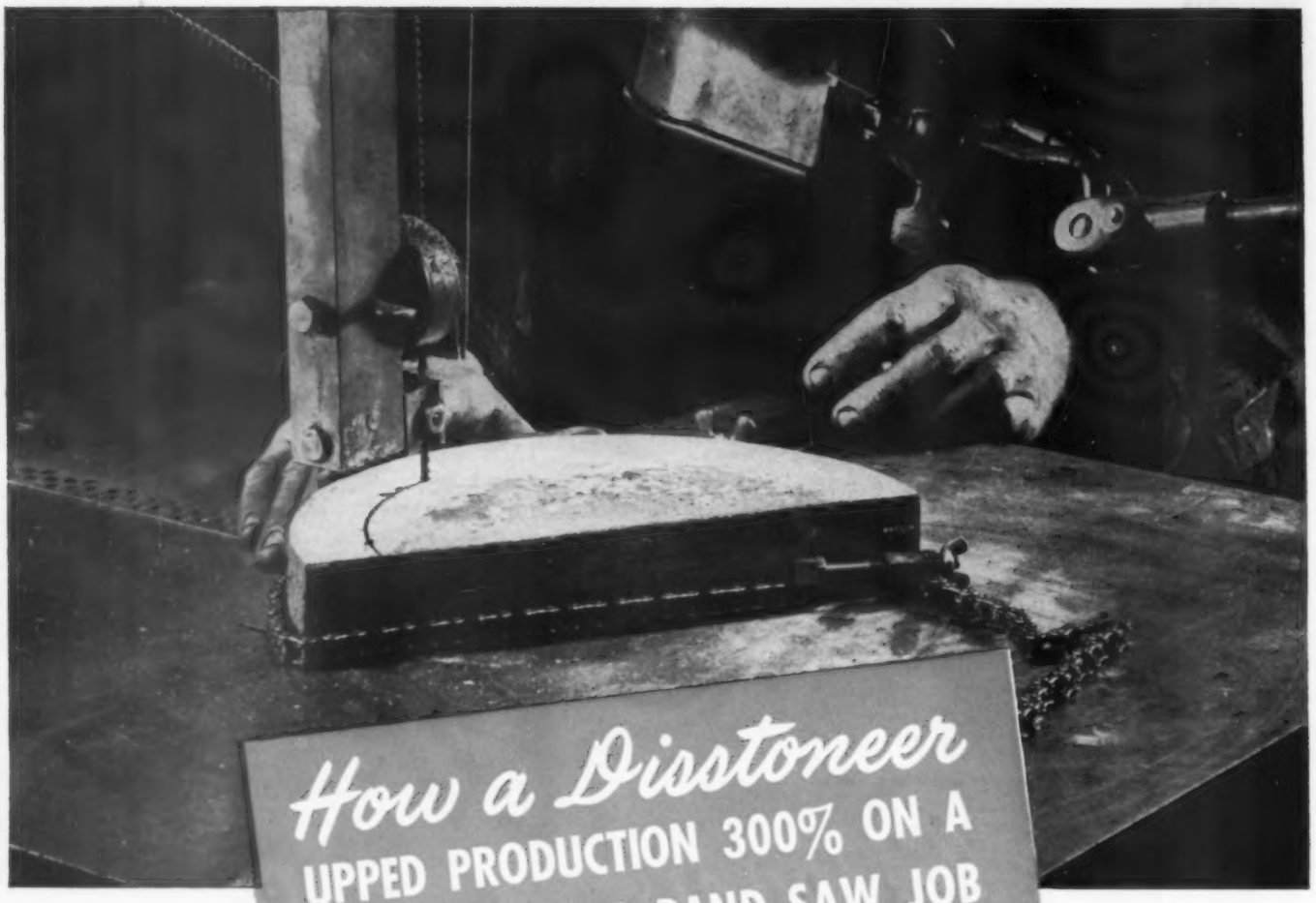


How a Disstoneer UPPED PRODUCTION 300% ON A METAL-CUTTING BAND SAW JOB

Cutting semi-circular units of 1½" boiler plate steel with Disston Hard Edge Flexible Back Band Saw Blade.

The material being cut was 1½" mild boiler plate (5.2 Brinell). Using a ½", 10-tooth blade, it took 1½ hours to saw out a complete unit and only one unit could be cut per blade. Since other operations were performed faster, a bottleneck resulted and highly paid workers were kept idle while waiting for the units to come through.

The Disstoneer* recognized a condition often met before . . . one that is frequently overlooked. The blade in size and number of teeth to the inch was not suited to the work. He recommended a Disston Hard Edge Flexible Back Band Saw Blade of a narrower width and a coarser tooth spacing. It was as simple as that . . . simple to the Disstoneer because he could draw from a long experience with metal-cutting operations of every kind. And the results . . .

Four complete units are now being cut with one blade—2 per hour, three times the production of the discarded blade. Wider tooth spacing provided more gullet room for chip clearance, permitting faster speeds and feeds. The bottleneck was eliminated. The narrower blade made cutting of the radius easier. Production costs and blade costs were reduced.

The Disstoneer may be able to do as much for you. His services are available without cost or obligation.

For further particulars, write direct or get in touch with your local Disston Industrial Distributor.

***DISSTONEER**—a man who combines the experience of Disston leadership and sound engineering knowledge, to find the *right tool* for you—to cut wood, to cut metal and other materials—and TO CUT YOUR COST OF PRODUCTION—*not only on special work, but on ordinary jobs as well.*

If you have a filing problem, you'll be interested in Disston Bite-Rite Files.

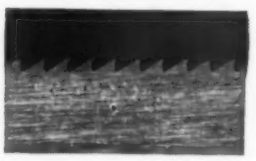
DISSTON BITE-RITE FILES ARE DIFFERENT

Disston Bite-Rite Files differ from ordinary files in design, construction and service qualities. One important difference is the tooth pattern. Instead of being in straight rows, the teeth are staggered, resulting in faster cutting and smoother work. Teeth are sharp, uniform and extra tough. They stand up long in hard service. Rounded gullets reduce clogging. All lengths, shapes and cuts . . . for all metals . . . for hand or machine use

Enlarged photographs looking into cutting face of teeth.

Ordinary type file with teeth in straight rows.

Disston Bite-Rite File with staggered teeth.



Ordinary type file: Clogging gullets.

Disston Bite-Rite File: Rounded, non-clogging gullets.

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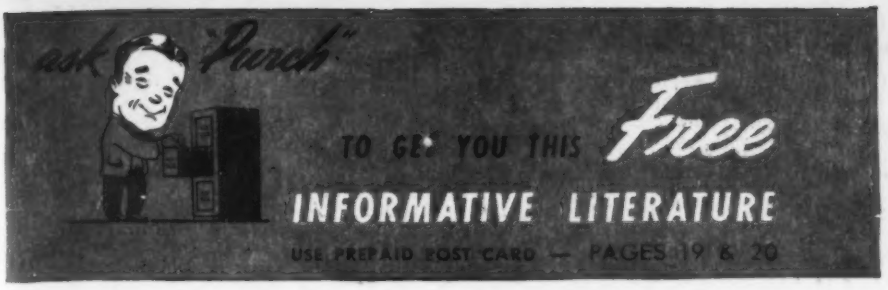

(*Continued from page* 16)

their economic and versatile performance. Low resistance cone housing keeps the motor, belts, and all bearings out of the air street. Westinghouse Electric Corp.

☐ **51. PALLETS**—"Pallet Buyers and Engineers Guide" is subject of 24-page booklet which defines pallets by illustrations, shows pallet patterns, and by text tells how to choose the proper pallet. A very informative booklet. Pallet Sales Corporation.

☐ **52. NEOPRENE**—Neoprene Notebook No. 39, tells about the utilization of Neoprene for hose for aromatic service, cable covering, binder for flexible grinding wheels, vibration controls, coating wire, and for a pipe wiper. It is published four times a year. E. I. du Pont de Nemours & Co.

☐ **53. HYDRAULIC CYLINDERS**—Catalog covers the entire line of Hydro-Line standard hydraulic cylinders, available in range of sizes from 1½" through 8" bore in various types of mountings. Catalog is designed to minimize the task of specifying size and type best suited for an intended application. Hydro-Line Manufacturing Co.

☐ **54. TUBE CLEANERS**—Catalog 76, 48 pages, 3 colors, covers the complete Wilson line of tube cleaners for use in refineries, power plants, marine boiler rooms, locomotives, and chemical process plants. Virtually every type of cutter-head is described in detail, as well as brushes and air, steam, and water driven motors, and electric equipment. Thomas C. Wilson, Inc.

☐ **55. ROLLER BEARINGS**—Link-Belt "DE" radial-thrust, self contained, preadjusted roller bearings are the subject of a new 16-pp. illustrated book No. 2196 published by Link-Belt Co. The book contains tables of dimensions, weights, bearing capacities at given rpm, shaft fit tolerance, housing fit tolerances, and data for calculating bearing capacity for different types of machinery.

☐ **56. DRILLING, TAPPING Machines**—Catalog "Portable Drilling and Tapping Machines" has been released by Kaukauna Machine Corp. Various models have tilting and universal head construction. Machines are readily portable.

☐ **57. TRUCK ELEVATORS**—Pow-R-Truck elevators engineered for use with materials handling equipment are subject of 8-pp. illustrated booklet which points out that freight elevators must be especially designed to stand up under the severe forces caused by industrial power truck loading, where truck itself may weigh 8000 pounds or more. Otis Elevator Co.

☐ **58. CARBIDE TIPPED Tools**—Catalog 101, new, lists and illustrates various types of carbide tipped tools. Listings include straight and taper shank spiral fluted drills, core drills, masonry drills, glass drills and drills for drilling hardened steel; lathe centers and reamers are also listed. Whitman & Barnes.

☐ **59. WIRE ROPE SLING**—Bulletin FLS-48 describes the Hercules Red Strand flat laced wire rope sling, which is made of six parts of wire rope laced together to form a flat, strong and flexible lifting device. This belt-like sling is said to provide greater flexibility, more resistance to kinking, easier handling, and longer life. A. Leschen & Sons Rope Co.

☐ **60. SHELLAC EXTENDER**—Bulletin describes Valite 7796-D, new thermoplastic resin extender for shellac and other natural resins. Maker states it is of standard controlled quality. Valite Corporation.

☐ **61. ELECTRODE CHART**—A 25" x 25" electrode wall chart in full color, which shows procedures for every type of arc welding electrode, is available from the Hobart Brothers Company.

☐ **62. GASOLINE ELEC. GEN. SETS**—Bulletin 1370 describes new line of gasoline electric generator sets available from 10KW to 125 KW in 23 sizes and models. Gasoline engine (also available with natural gas and butane engine) is water cooled and compactly built. The Buda Company.

☐ **63. ROLL YOUR OWN**—Tube mills for transforming strip steel into mechanical tubing with outside diameters up to 4" and American Standard Weight pipe ½" through 2", are the subject of catalog issued by American Electric Fusion Corp.; speeds up to 65 ft. per minute. Tubing is formed, welded, scarfed, sized, straightened and cut to length in one continuous, automatic operation.

☐ **64. WIRE ROPE CONNECTORS**—Pocket size catalog, 32 pages, describes the complete line of Flege wire roper connectors. It includes condensed analysis of the three main types—open end or clevis type, eye end type, and stud end type. Electroline Company.

☐ **65. SPRAY PAINTING EQPT.**—Catalog 96 just issued by the Binks Manufacturing Co. shows the company's complete line of spray painting equipment and accessories. There is also a nozzle selection chart for air and material nozzles.

☐ **66. DRILL HEADS**—The Commander Multi-Drill adjustable 6 and 8 spindle drill head which will drill up to 6 or 8 holes at one stroke and are adjustable to any pattern is described in new bulletin. Will handle taps from #0 to ¾". The new tapper is designed to fit any drill press. The Commander Mfg. Co.

☐ **67. PRESS ROOM EQPT.**—Bulletin describes hydraulic stock feed, stock straightener and scrap cutter for use on punch presses with all stock to 3/32" thickness and 4" width. Haller Machine & Mfg. Co., Inc.

☐ **68. RECESSING TOOLS**—Brochure R-246 describes line of recessing tools, with detailed drawings which show types of recessing, back facing and grooving operations. Tools are adaptable to any drill press, boring mill, turret lathe, automatic, milling machine, etc. The Maxwell Co.

☐ **69. RESIN ADHESIVES**—12-page booklet deals with Cyanamid resin adhesives and illustrates the range of applications where they have been found effective. American Cyanamid Co.

☐ **70. FLOOR BOX & SERVICE Fittings**—Catalog No. 553, 4-pages, illustrated, covers floor box and service fittings for light, power, telephone, signal and bell system floor convenience outlets. Can be installed in conjunction with National Electric's Nepco-

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(*Continued from page* 19)

duct underfloor electric distribution system, or with standard electrical conduit. National Electric Products Corp.

☐ **71. OVERLOAD PITMAN**—Hydraulic overload pitman for use on punch press, is subject of bulletin issued by Dayton Rogers Manufacturing Co. Pitman eliminates damage to punch press crank and frame; calibrated hydraulic relief valve can be set for any desired working tonnage; quickly and easily installed.

☐ **72. DUPLEX LAPPER**—Folder 993-47 describes Duplex Lapper Model 993, for lapping gears ranging from 2½" to 20" in dia. and clusters up to 30" in length. As it is of the Multiple lap type, two gears may be lapped at one time (as on cluster) or both laps may be used on the same gear. Machine is said to be ideal for short runs on variety of gears. Michigan Tool Co.

☐ **73. CARBOLOY DIES**—Carboloy Die Engineering Manual, No. 4-124, 36 pages is believed to be the first comprehensive manual covering the design, fabrication, application, and maintenance of carbide sheet metal dies. Carboloy Co., Inc.

☐ **74. BEARING CATALOG**—60-page catalog of machine tool bearings and spindle designs has been issued by SKF industries. Bearing applications for turning and boring equipment and grinding machines are discussed in detail. The oil mist lubricator designed to lengthen life of spindle bearings is also described.

☐ **75. PACKING**—Special interior packing, concentrated loads, and fast production line packaging are featured in brochure which shows solution of these packing problems in picture form. General Box Co.

☐ **76. BOILER FEED HEATERS**—Bulletin 4091 describes Direct Contact open heaters which offer the advantages of fuel savings, water savings, gas removal and minimum rusting. It also tells about open heaters, jet type for use where large quantities of water are to be heated. Cochrane Corp.

☐ **77. CENTERLESS GRINDING**—Bulletin G-570 describes Cincinnati No. 3 centerless grinding machine, and accessories and attachments. Illustrations of parts ground shows units of steel, cast iron and rubber; hollow and solid parts; spherical, out-of-balance, single and multiple diameter parts. Cincinnati Grinders Inc.

☐ **78. FIREPROOFING FABRICS**—Folder gives technical information on the physical properties of the B. F. Goodrich Company's Permaproof Series 200 flameproof compounds. Flameproofing is extremely durable, tensile strength of fabric is increased, and fabric may be printed.

☐ **79. LIFT TRUCK**—Ross hydraulic lift truck series 5, capacity 2½ tons, gasoline powered front wheel drive is illustrated in Bulletin 5. It is termed the lift truck with unlimited visibility. The Ross Carrier Co.

☐ **80. RHEOSTATS, RESISTORS**—Catalog and Engineering Manual No. 40 describes the Ohmite Manufacturing Company's complete line of rheostats, resistors, tap switches.

☐ **81. NYLON ROPE**—Folder describes "Stabilized" Nylon rope. The process makes the yarns and strands of nylon shape to conform to the lay of the rope. Columbian Rope Co.

☐ **82. NAMES & TRADEMARKS**—Name and trademark plates etched and lithographed on brass, bronze, copper, Monel, nickel silver, stainless steel and aluminum, are described in bulletin issued by Premier Metal Etching Co.

☐ **83. BELT CUTTER**—Alligator wide belt cutter is the subject of bulletin issued by Flexible Steel Lacing Co. Cutter makes it possible to cut belts up to 60 in. in width and up to 1⅛" thick.

☐ **84. SHEAR & PRESS**—30-ton combination shear and press known as the Multi-Max press which shears, blanks, notches, punches, perforates, pierces, lances, bends or forms sheet metal forms in single or multiple parts, with one operator, is described in 4-page bulletin. Parker Manufacturing Co.

☐ **85. PRECISION GAGING**—20-page book describes Merz New-Matic measuring machines which are "designed to break the most stubborn inspection bottle-necks". Book tells how system increases accuracy and speeds up intricate sorting and measuring operations. Merz Engineering Co.

☐ **86. SPEED REDUCERS**—Catalog describes Eberhardt-Denver worm gear speed reducers. This standard on-the-shelf line of small worm gear speed reducers offers 29 models, single and double reduction, horizontal and vertical. Catalog also describes line of 12 standard heavy duty reducers, and custom-built units. Eberhardt-Denver Co.

☐ **87. BEARINGS**—Bulletin, CY-47 describes new Multirol cam yoke roller bearings which provide wide adaptability to all types of automatic machinery. McGill Manufacturing Co., Inc.

☐ **88. SOAP CLEANSER**—Free trial sample of Commodore, a coarse grind soap for extra heavy duty, and Treet, a fine grind soap for heavy duty, will be sent to you by Lightfoot Schultz Co.

☐ **89. PRE-FINISHED METALS**—16-page illustrated book describes pre-finished Nickeloid preplated metals. It contains instruction for bending, blanking, drawing, etching, forming, riveting, seaming, soldering and welding. American Nickeloid Co.

☐ **90. STAINLESS ELECTRODES**—"What Electrode to Use to Weld a Specified Stainless or Alloy Steel" is title of bulletin 1047 that also contains a complete chart of the trade names of stainless alloys produced by mills in this country. It also provides information on base metal identification of solid and clad materials, considerations involving corrosion, as well as heat or strength properties. Arcos Corp.

☐ **91. DIE LIFTS**—Bulletin describes Di-Lifts, capacity 2000 lbs., and 500 lbs. respectively; latter may also be used for loading and unloading trucks. Machine Tool Accessories Divn., Montgomery & Co.

☐ **92. SLOTTERS**—Bulletin 460 covers Rockford Hy-Draulic Slotters, 36" and 48" stroke sizes. Table provides three types of feed to meet any work requirement—longitudinal, transverse, and rotary. Design permits high speed operation. Rockford Machine Tool Co.

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70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92

NAME..... **Title**.....

COMPANY .....

ADDRESS .....

CITY..... **Zone**..... **STATE**.....

At the production rate of three pieces per minute, the S. K. Wellman Company of Cleveland, Ohio, is performing grooving operations on powdered metal aircraft parts approximately four times faster than ever before. This has been achieved by incorporating several automatic devices with a standard Walker-Turner Radial Cut-Off Machine to convert it into an automatic-radial grooving machine.

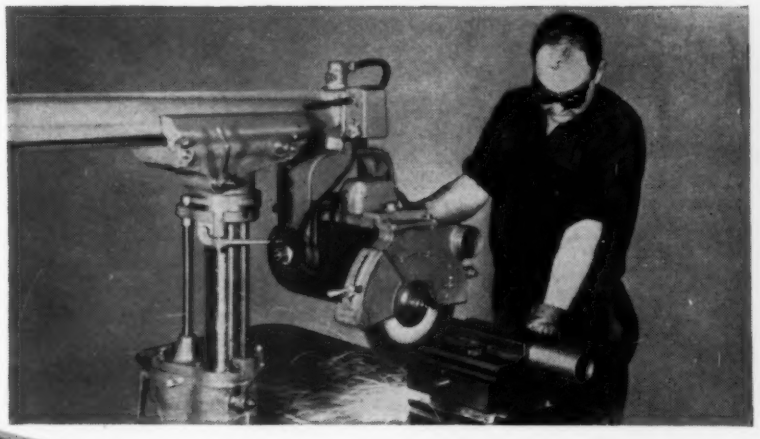
For this grooving operation the Radial Cut-Off Machine is equipped with a diamond impregnated metal wheel to do the cutting, and a magnetic chuck for work holding. The sliding head is motivated by an air cylinder with provisions for metering the feed. With this set-up extremely accurate work is done—the depth of each groove held within .003", and the accuracy of the index within .005".

In addition to increased production, Walker-Turner Machine Tools have given the S. K. Wellman Company continued operation with trouble-free maintenance. Says Mr. S. E. Truesdell of the company's engineering department: "Three Walker-Turner machines have been in our possession about five years, and in that period a very minimum, if any, maintenance has been required. We find these machines *... are highly adaptable to intricate machining jobs with minimum set-up time.*"

For complete catalog, write to Walker-Turner Company, Inc., Plainfield, New Jersey.

Photo left: Radial Cut-Off Machine in S. K. Wellman set-up for radial grooving with magnetic chuck and diamond wheel. Indexes automatically at the end of each ram traverse cycle.

Photo, below: Radial Cut-off Machine, Model MRA-1130, 3 h.p., 3450 r.p.m. motor. Price: Less abrasive wheel, magnetic overload release and base **$485.00.**



FOR EXAMPLE

GROOVING OPERATIONS 4 TIMES FASTER
by S. K. WELLMAN COMPANY
with WALKER-TURNER radial cut-off machine

walker-Turner MACHINE TOOLS

DRILL PRESSES—HAND AND POWER FEED
RADIAL DRILLS • RADIAL SAWS
BAND SAWS—FOR WOOD OR METAL
RADIAL METAL CUT-OFF MACHINES • MOTORS

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Are you saving money with "the right tape in the right place"?

Read this economy story. It may save you time and money; improve your product.

Bauer & Black Industrial Adhesive Tapes perform thousands of jobs in industry. The more than 100 tapes in our line are *specific* tapes for *specific* uses, with practically any desired quality built right into them. Because they are designed for highly specialized work, savings over conventional materials range from 5 to 85%. Or, by speeding up production, they save *time* costs.

HERE ARE A FEW OF THE JOBS Bauer & Black Industrial Adhesive Tapes are made to do efficiently and cheaply:

WATERPROOFING • WEATHERPROOFING • TYING, BUNDLING AND REPAIR • IDENTIFICATION • FINGER PROTECTION • MOISTURE VAPOR BARRIER • INSULATION • SOUND DEADENING • PACKAGING OIL RESISTANCE • SOLVENT RESISTANCE • ABRASION RESISTANCE

OUR FREE CATALOG will give you complete information—write Dept. 9-3 today. You'll probably find the tape you need, but, if necessary and to our mutual advantage, we'll make it if you can't find it!

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Each of the following distributors maintains at least one factory trained specialist to help you with your tape problem.

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Industrial Adhesive Tape

PRESSURE SENSITIVE

Production Short Cuts to Reduce Costs • Research to Speed and Improve Methods

THE UDYLITE WAY...

• *At least 50% increase in plating speed*—that's the proved accomplishment of Udylite's Bright Nickel Process.

This means 50% more plating with the same voltage, in the same time, without additional manpower or costly equipment alteration.

The Udylite Way to faster bright nickel is based on specially developed Udylite Brighteners in a high-chloride bath. The result is not only *faster* plating but definitely *better* plating because the Udylite Process offers the following advantages: Exceptional tolerance to contamination; uniform deposits over a wide range of current densities; high rate of brightening; less tendency to form nodules; simple to operate and control.

A Udylite Technical Man will gladly tell you all the details of the Udylite Bright Nickel Process and show you how Udylite research has developed processes tailored to your own plating need. Write, wire or 'phone the Udylite Corporation, Detroit 11, Michigan. Offices in Principal Cities.

PIONEER OF A BETTER WAY IN PLATING...

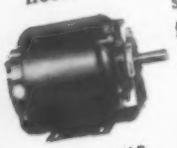
TESTED SOLUTIONS • TAILORED EQUIPMENT
AUTOMATIC CONTROL FOR METAL FINISHING

THE Udylite CORPORATION

Twin-gineered TO FIT YOUR APPLIANCE

58 YEARS of Engineering Experience MESHED with YOURS...

Pioneers in the manufacture of motors, 1/20 to 5 H.P., Emerson-Electric engineers mesh their experience with yours in supplying the correct motor for efficient and economical appliance performance.



1/20 to 5 H.P. AC and DC

Meshing the right type of "power" with the right kind of motor-driven appliance is more than a ONE-man job. It calls for collaboration between motor and appliance engineers, and the earlier such partnership is established, the better for both!

Such collaboration — *Twin-gineering,* we call it — may save you considerable engineering back-tracking — may suggest many money-saving short cuts in manufacturing — may help you equip your new or improved product with the operational efficiencies necessary for greater user-satisfaction and market success.

Emerson-Electric engineers are now at your service, ready and able to gear their ideas, experience and skill to yours. To add this vital cog to your own business success, write to Emerson-Electric TODAY; there is no charge for this service.

THE EMERSON ELECTRIC MFG. CO., St. Louis 21, Mo.

Branches: New York • Chicago • Cincinnati • Detroit • Los Angeles • Davenport

65

EMERSON ELECTRIC

MOTORS · FANS — APPLIANCES

GRINNELL PROTECTION COULD HAVE PREVENTED THIS

YOUR PLANT IS BURNED and you must justify yourself before your Board of Directors . . . it is your word against the facts.

Will this be your defense?

YOU: *"Gentlemen, I wish to assure you I did everything I knew to protect our property and investment. I could not forsee a situation like this...it looks like carelessness with a cigarette."*

THE FACTS: It is a well-known and established fact that everyone who is human is careless at times. Anticipating carelessness is part of management's responsibility.

YOU: *"Our buildings were all of fireproof construction . . ."*

THE FACTS: But stored materials are seldom fireproof. All too often a fireproof building may merely serve as a stove for blazing contents.

YOU: *"I saw to it that we were covered by insurance. Of course it is not adequate for rebuilding at today's prices. We'll need capital — a lot of capital — IF we rebuild."*

THE FACTS: That property cannot be replaced for its insurance value today is but one of five sad aftermaths of fire. The other four, as managers of fire-gutted plants will attest, are: (2) An indemnity check never buys back a lost customer. (3) Burned-out records are lost forever. (4) Employees wander away. (5) Two out of five burned-out businesses never resume operation.

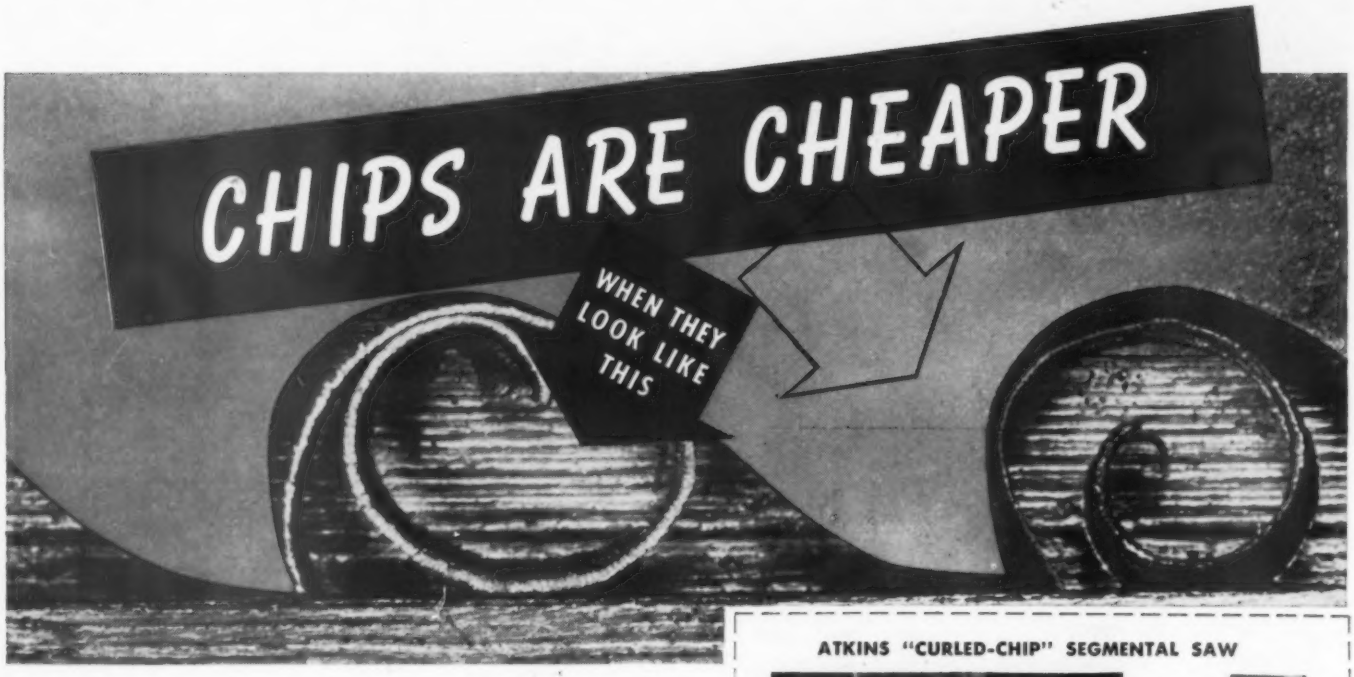
There is no sure way to prevent fire. But there *is* one sure way to stop fire immediately, automatically, wherever and whenever it strikes . . . Grinnell Protection by automatic sprinklers. Any competent fire chief will tell you that it is the surest way. On top of that, it usually pays for itself in reduced insurance premiums in a few years. So, if you're insured, you're paying for Grinnell Protection . . . . *Why not have it?* Grinnell Company, Inc. Providence 1, R. I. Branch Offices in Principal Cities

GRINNELL

FOUNDED 1850

Automatic Sprinkler and Special Hazard Fire Protection Systems

ATKINS "Curled Chip" System of Metal Cutting



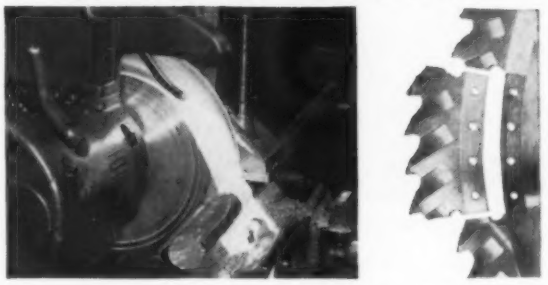
Think of the cost of cutting metal in terms of the cost of chips, figuring the power, the tool cost and the time it takes to produce a given quantity of chips. On that basis, Atkins "Curled Chip" Saws give you cheaper chips—cut more metal at lower cost. Here's why:

The conventional angular tooth wastes power and dulls its edge pushing the chip against a vertical face. But with Atkins Curled-Chip Teeth, the inward curved cutting face gets *under* the chip and *lifts* it with a single, curling, lathe-tool action. The chip explodes from the gullet like a suddenly released clock spring. Tooth-dulling heat caused by high back-pressure is minimized. Heavier feeds and faster cutting speeds can be used, with less danger of tooth breakage from clogged gullets.

Cutting action is cleaner, faster, truer. Less re-machining of metal in process is needed, less metal is wasted; less power is required.

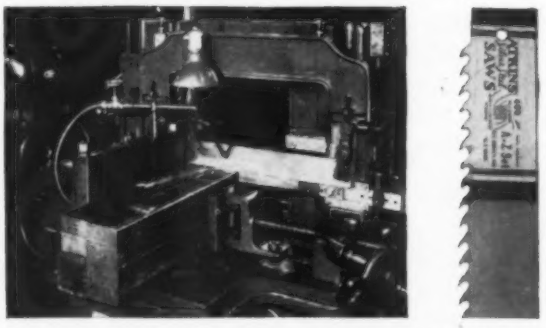
To find out how the Atkins Curled-Chip System can bring you these benefits and step-up your metal cutting efficiency check with your Industrial Distributor today.

ATKINS "CURLED-CHIP" SEGMENTAL SAW



Engineered to meet the toughest demands of heavy duty circular sawing machines. "Curled-Chip" teeth in segments permit consistently narrower cutting width. Worn teeth can be quickly replaced without discarding the saw disc.

ATKINS "CURLED-CHIP" POWERSAW BLADES



High cutting speed and low cost per cut combine with cleaner, truer cutting to give you better metal cutting performance. Famous Atkins "Silver Steel" assures longer blade life.

ATKINS
"ATKINS ALWAYS AHEAD"

E. C. ATKINS AND COMPANY • HOME OFFICE AND FACTORY: 402 S. ILLINOIS STREET, INDIANAPOLIS 9, INDIANA • BRANCH FACTORY: PORTLAND, OREGON
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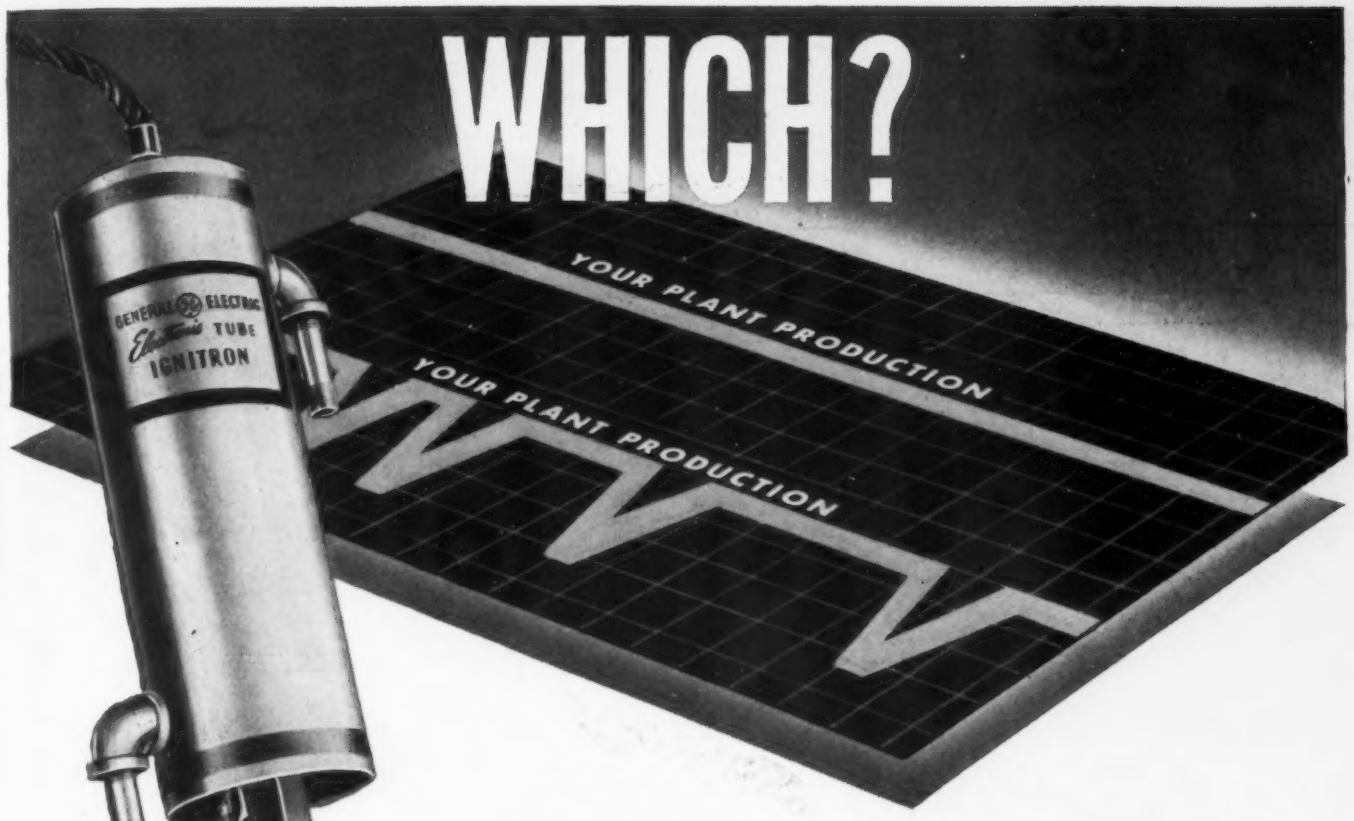
MAKERS OF BETTER SAWS FOR EVERY CUTTING JOB

POWER AND HAND BLADES • MILLING SAWS • SLITTING SAWS • SEGMENTAL COLD SAWS • METAL CUTTING BANDS



G-E Same-day Tube Service Cuts Machine Outage Time!

STOPPAGES in production do more than put gray hairs in the heads of management. Stalled assembly lines slice still thinner, the narrow margin between cost of manufacture and selling price of quantity-produced goods.

You can't afford equipment shutdowns. And a good percentage of your lathes, welders, presses, your modern machines of all types—electronically controlled—use tubes which, while long-serving, now and then require replacement.

How long before that essential new tube can be plugged in? Phone your local G-E tube distributor or dealer—his reply will be music to your ears. First, he has the tube or tubes. Second, they'll be at your door as fast as gasoline and four wheels can carry them!

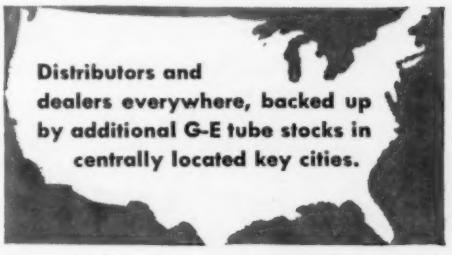
G-E SAME-DAY TUBE SERVICE . . . take advantage of the emergency facilities it offers you. Better, get to know your local source of supply for G-E tubes *now*—so he can acquaint himself in advance with your needs; so he can explain fully the extra value-assurance given you by G.E.'s tube warranty. *Electronics Department, General Electric Company, Schenectady 5, New York.*

GL-5551/FG-271

IGNITRON

Does one of the many vital jobs performed by electronic tubes in your factory. GL-5551/FG-271's are used in welder-control work, opening and closing the main welding circuit. If a welder stops for need of a new ignitron—perhaps a sub-assembly or assembly line stops with it! Replacement delay then means dollars lost . . . Tube ratings:

Max kva demand, with avg anode current 30.2 amp	600
Max avg anode current, with kva demand 200	56 amp



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FIRST AND GREATEST NAME IN ELECTRONICS

skilled springmakers . .
AND practical,
experienced engineers,
SPECIALISTS
in spring design
and manufacture
at Accurate

It takes people to make springs. Ours are specialized, highly trained, long-experienced people—well qualified to give you the finest in spring craftsmanship.

Q Our engineers too, are an important reason why you'll like Accurate Spring Service. They're old hands at spring-making . . . they've developed manufacturing systems and procedures that enable us to handle your jobs with the greatest speed and efficiency. These Accurate engineers are at your service on spring design problems. You will benefit from their practical assistance in designing exactly the right spring for your application.

Q Why not try Accurate on your next job.

Send for your copy of the new Accurate Spring Handbook. It's full of data and formulae which you will find useful. No obligation of course.

ACCURATE SPRING MFG. CO.
3825 W. Lake Street Chicago 24, Illinois

Accurate Springs

SPRINGS • WIREFORMS • STAMPINGS

Perfect Combination for LOWER COST PER MILE!

Your U. S. Distributor is an expert in tire care. And he's an expert in fitting tires to the job. He'll make sure your trucks are equipped with the right tire and the right size for your particular operation.

Through his U. S. Fleet Service program, he can provide you with preventive maintenance that means plus mileage. For instance, he'll inspect your trucks regularly, replace worn out tires and tubes *before* they cause expensive delays, and recap and repair in time. He'll recommend changes in inflation, loads and speeds for more economical operation.

When you add this kind of service to tough, long-wearing U. S. Royal Fleetways, you've got the perfect combination for *lower cost per mile!*

Call your U.S. Distributor TODAY for free inspection of your tires. He's listed in your Classified Telephone Directory.

U.S. ROYAL TIRES

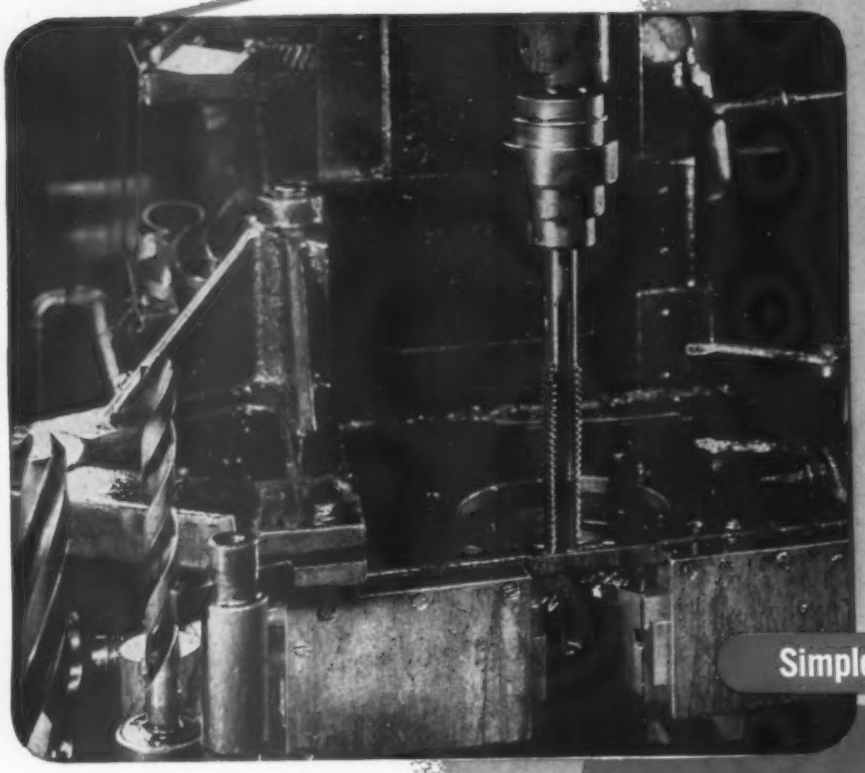
UNITED STATES RUBBER COMPANY *Serving Through Science*

52 Pieces per Hour!

BESLY TAPS

Help to Set New Production Records on Nuts for

Simplex Steamboat Ratchets



Above: Templeton, Kenly & Co.'s special drill press with lead screw for tapping. Pneumatic-powered fixture is in open position. Note different size drills on bench at left, used on same equipment for drilling nuts before tapping.

At right: Type L steamboat ratchet pulling jack. Nuts measure 2⅛" (diameter) by 2¼" (long). Two are used in each jack.

At one pass Acme form Besly Taps thread the large cold rolled steel nuts used in Simplex steamboat ratchet pulling jacks manufactured by Templeton, Kenly & Co., Chicago. A special drill press with self-contained lead screw is employed. Previous conventional methods required two or three passes.

Tap is 1½", 4 Acme thread. An important saving in labor costs is obtained . . . established tolerances are met.

Out of their experience in working with the technical experts in many industries, Besly engineers may be able to point out similar opportunities in your own tapping operations. Ask your Besly distributor for information, or write us today.

NOW . . .
in the Second Edition

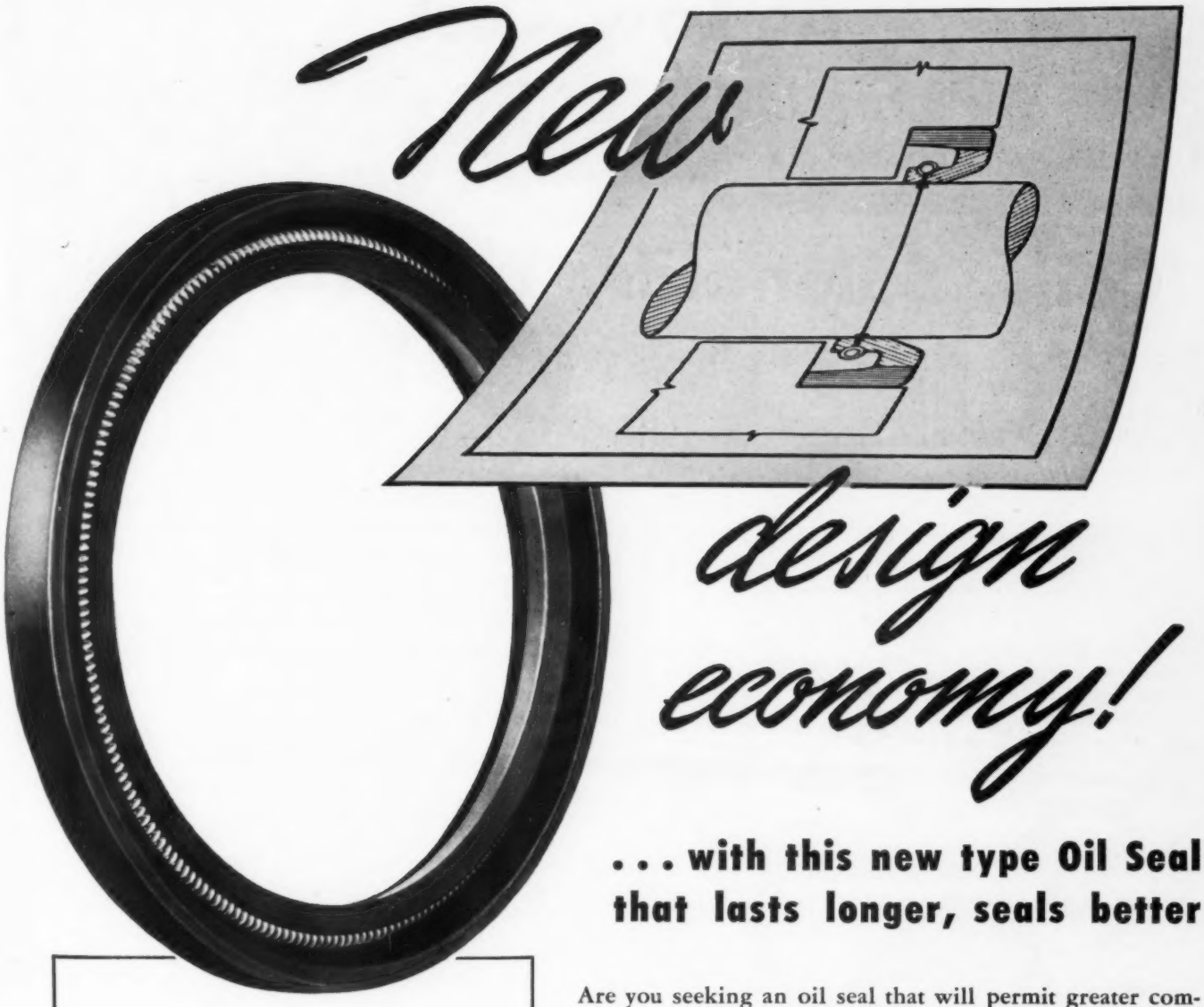
Write for your copy of this valuable Tap Manual today! It contains valuable facts on taps, tap fits, and tapping procedures. You'll find it helpful in selecting the right tap for every job.

BESLY

BESLY TAPS • BESLY TITAN ABRASIVE WHEELS
BESLY GRINDERS AND ACCESSORIES

CHAS. H. BESLY AND COMPANY, 118-124 N. Clinton St., Chicago 6, Ill., Factory: Beloit, Wis.

New design economy!



. . . with this new type Oil Seal that lasts longer, seals better

Are you seeking an oil seal that will permit greater compactness and economy of design?

Clipper Seal may be the answer!

This new type Johns-Manville oil seal is available with a light flange section that permits designing oil seal cavities with depths as little as ¼". In fact, because of its unique 1-piece design, there is no cavity mechanically practicable which is too shallow—or too deep—for a Clipper Seal.

Consisting of a rigid heel and a tough but flexible lip moulded into a single unit, Clipper Seals provide an exceptionally long wearing oil seal with superior lubricant-retaining, dirt-excluding qualities. They are easily installed and may be removed without damage. Non-metallic, they are also resistant to most forms of corrosion.

Clipper Seals are made to fit any size shaft from ⅝" diameter to 68" O.D. For further information, write Johns-Manville, Box 290, New York 16, N. Y.

Clipper Seals were developed by Johns-Manville to protect vital bearings in our fighting planes during World War II. Their superior advantages as an oil seal were thoroughly tested and proved. Now Clipper Seals are available to industry to provide the same efficient, long-term bearing protection.

JOHNS MANVILLE
JM
PRODUCTS

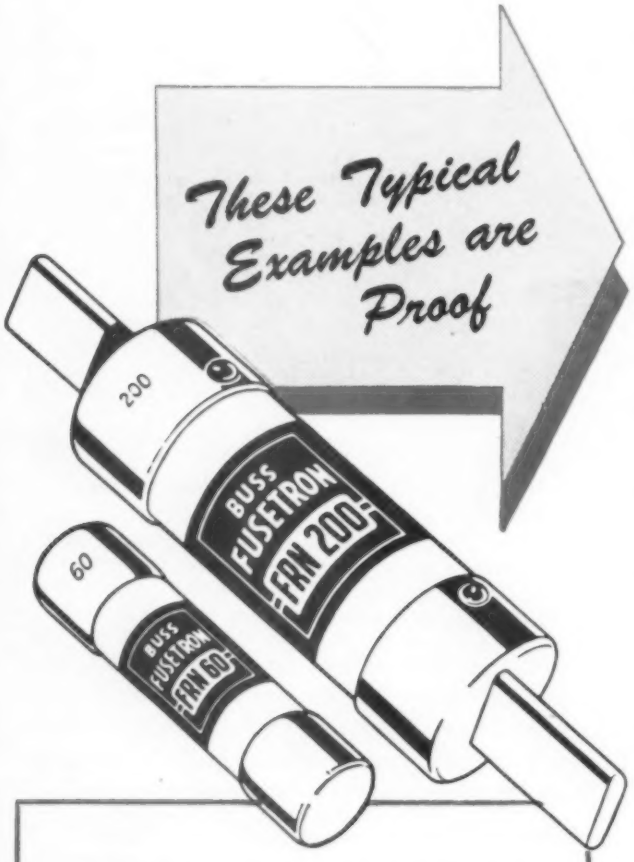
Johns-Manville **PACKINGS & GASKETS**

At Low Cost

FUSETRONS PROTECT

Coils, Solenoids, Transformers

AGAINST BURNOUTS



"In this institution we have 5 dumb waiters or elevators used for delivering meals to the various floors. They are driven by 5 h.p. motors. Prior to 1938, 10 ampere one-time fuses were used in the control circuit to protect the coils and 30 ampere fuses were used in the motor circuit. The 10 ampere fuses were too large to protect the coils properly, and they burned out frequently. Fuses in the motor circuit blew so frequently that it was necessary for a man to stand by three times a day at mealtimes ready to replace fuses as they blew.

"In the fall of 1938, when I became Chief Engineer of this hospital, one of the first things I did was to check over all panels, switches and fuses. In these elevator circuits I installed 6¼ ampere Fusetrons to protect the coils in place of 10 ampere one-time fuses, and 20 ampere Fusetrons in the motor circuit in place of 30 ampere one-time fuses. In August of 1945, I was able to report that since this was done in 1938, not one coil has burned out and it was no longer necessary to have a man stand by at mealtimes to replace fuses in the elevator motor circuit. That trouble has disappeared entirely."

Leland J. Mamer, Chief Engineer
Evanston, Ill.

"The transformers on our meter testing boards require protection by one ampere fuses. These fuses, however, were blown whenever a motor was cut in on the ascending cycle of the current wave due to current surge.

"In October 1945 we installed one ampere Fustats (Fusetrons with a tamper-resisting base). They reduced needless blows from about five per week to one per month and at the same time completely eliminated any danger of damage to the transformers in the circuit."

A. L. Pollard
General Superintendent of Operations
Puget Sound Power & Light Co.
Seattle, Washington

What is the Fusetron?

The Fusetron is a Dual Element device — a Fuse to which is added a Thermal cutout.

The result is a fuse with tremendous time-lag and much less electrical resistance.

Fusetrons have the same degree of Underwriters' Laboratories approval for both motor-running and circuit protection as the most expensive devices made.

Made to the same dimension as ordinary fuses, Fusetrons fit all standard fuse holders.

Obtainable in all sizes from 1/10 to 600 ampere in both 250 and 600 volt types. Also in tamper-resisting type (Fustats) for 125 volt circuits.

Their cost is surprisingly low.

BUSS

Eliminate Shutdowns Simply and Inexpensively

Fusetrons Can Save Costly and Troublesome Replacement Jobs

Why risk the loss of expensive coils, solenoids and transformers when you can protect them with Fusetrons? At a cost of just a few cents, a Fusetron, properly installed, will protect against costly burnouts.

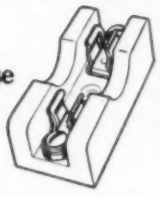
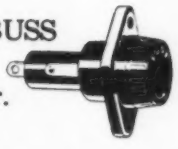
A transformer or coil can be protected because the long time-lag of the Fusetron permits it to hold all normal current surges and harmless overloads — yet it will open to prevent burnout on any dangerous overload.

A solenoid, likewise, can be protected because the Fusetron will not open on the operating surge but will open in time to protect should the heavy current continue too long for any reason.

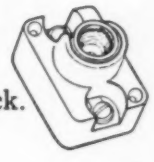
Burnouts mean costly and troublesome repair or replacement jobs. Why take a chance on crippling your operations?

Here's All You Need

TO PROTECT COILS, SOLENOIDS, TRANSFORMERS.

A Fusetron of proper size, plus a fuse block—  or a BUSS fuse-holder. 

On voltages up to 125, the same accurate, dependable protection can be provided with

a proper size plug Fusetron or a Fustat, plus a fuse block. 

Fusetrons Give Many Other Kinds of Protection Heretofore Not Available

Fusetrons do everthing fuses do, as is confirmed by Underwriters' Laboratories Label, and in addition . . .

- ★ Entirely wipe out needless blows caused by motor starting currents or other harmless overloads.
- ★ Give Thermal Protection to Panelboards and Switches.
- ★ Lesser resistance means cooler operation and prevents needless blows caused by heating in panels and switches.
- ★ Permit use of larger motor or adding more motors on circuit WITHOUT installing larger switch or panel.
- ★ On new installations, PROPER size switches and panels can be used instead of OVERSIZE.
- ★ Protect small motors against burnout, simply and inexpensively.
- ★ Give DOUBLE protection to large motors.
- ★ Provide simplest way to stop burnouts from single phasing.
- ★ Protect coils, transformers and solenoids against burnout.

Get All the Facts

Get Better Protection — Send the Coupon Now

Don't risk avoidable losses. One burned out solenoid — or one needless shutdown — or one destroyed panel — may cost you more than replacing every fuse with a Fusetron.

You simply protect your pocketbook by installing Fusetrons throughout the entire electrical system.

Fusetrons

Sold Through Wholesalers

Bussmann Mfg. Co., University at Jefferson
St. Louis 7, Mo. (Division McGraw Electric Co.)
Please send me complete facts about BUSS Fusetrons.

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*Title*_____

*Company*_____

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Dodge develops *outstanding* power transmission products, as proved by the big success of Dodge-Timken Bearings on millions of industry's toughest jobs.

Dodge-Timken Bearings are supplied promptly from stock in four basic types and a wide range of sizes to meet an almost limitless variety of anti-friction problems.

Dodge also produces Ball Bearing Pillow Blocks which, with Dodge-Timken Bearings, comprise the famous "30,000 hour line." Write for complete bulletins.

DODGE MANUFACTURING CORPORATION
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NAME PLATES

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It Takes 3 Different Steels to "Make Yours Vanilla"

This syrup pump for soda fountains is readily accepted by health authorities because it's made of stainless steel.

Like many stainless products, however, this pump requires more than just a single steel. *Three* different stainless types are used—each for a specific advantage. The plunger assembly is Type 303 bar (machinability) . . . the cover plate and deep drawn cup are 302 sheet (ductility) . . . and the two fluid lines are 304 tubing (weldability). Despite this mixed requirement, all 3 forms, in the necessary analyses, are obtained *overnight* from Frasse warehouse.

In fact, you can choose from *seven* stainless types when you work from Frasse stocks. And you can work with sheets, plates, strip, tube, pipe—everything from bars to welding electrodes. All are immediately available stock items.

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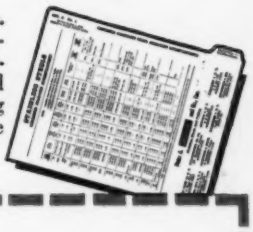

Frasse Data Chart Sec. A, No. 1 lists all 31 standard stainless steels, and chemical analysis of each. Chart is heavy card stock, file size—just the thing for wall or desk use. Send the coupon for your free copy.

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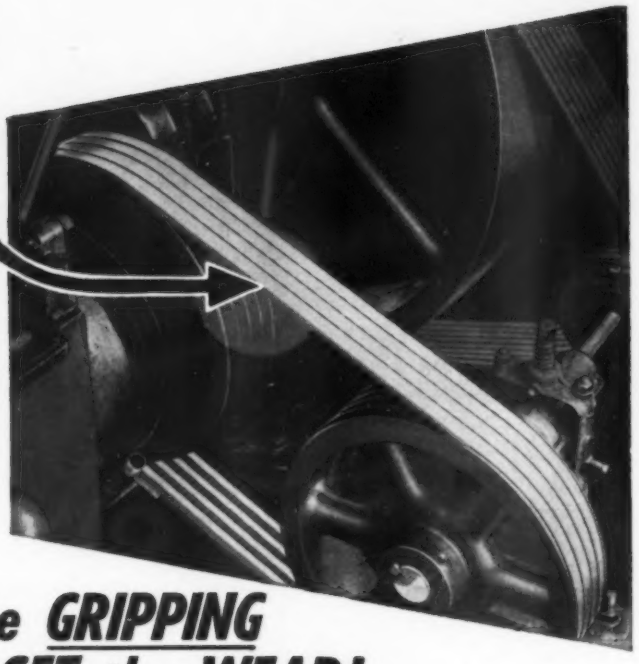
THE SIDES of a V-BELT

Diagram of V-Belt in Sheave-Groove

Are ALL that TOUCH the Pulley



The SIDES Do ALL the GRIPPING Naturally — They GET the WEAR!

The moment you look at a V-Belt in its sheave, you see that the *sides* are the only part that ever *touch* the pulley. The *sides* do all the *gripping*—they get *all the wear* against the sheave groove wall. The sides *pick up* the load. They transmit that load to the belt as a whole. And then, once more, the sides—and the sides alone—take hold of the driven pulley and deliver the power to it.

That is why you have always noticed that the sidewall of the *ordinary* V-belt is the part that *wears out first.*

That's Why the CONCAVE SIDE
A GATES PATENT

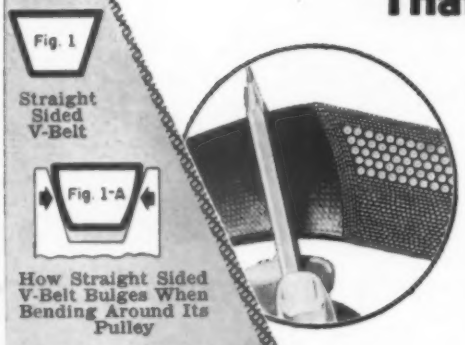


Fig. 1

Straight Sided V-Belt

Fig. 1-A

How Straight Sided V-Belt Bulges When Bending Around Its Pulley

You can actually feel the bulging of a Straight-sided V-Belt by holding the sides between your finger and thumb and then bending the belt. Naturally, this bulging produces excessive wear along the middle of the sidewall as indicated by arrows.

Fig. 2

Gates V-Belt with Patented Concave Sidewall

Fig. 2-A

Showing How Concave Side of Gates V-Belt Straightens to Make Perfect Fit in Sheave Groove When Belt is Bending Over Pulley.

No bulging against the sides of the sheave groove means that sidewall wear is evenly distributed over the full width of the sidewall — and that means much longer life for the belt!

Is IMPORTANT to You

Since the sidewall is the part that wears out first, anything that prolongs the life of the sidewall will naturally lengthen the life of the belt.

The simple diagrams on the left show exactly why the ordinary, straight-sided V-belt gets excessive wear along the *middle* of the sides. The diagrams show also why the Patented Concave Side greatly *lengthens the life* of the *sidewalls* of Gates Vulco Ropes. That is the simple reason why your Gates Vulco Ropes are giving you so much longer service than any straight-sided V-belt can possibly give.

The Concave Side is Even MORE IMPORTANT Now that SUPER VULCO ROPES *Are Available!*

Now that Gates *SPECIALIZED* Research has resulted in Super Vulco Ropes capable of carrying much heavier loads—fully 40% higher horsepower ratings—the sidewall of the belt is called upon to do even more work in transmitting these heavier loads to the pulley. Naturally, with heavier loading on the sidewall, the life-prolonging Concave Side is more important now than ever before!

The Gates Rubber Company
"The World's Largest Makers of V-Belts"
DENVER, U. S. A.

483

Gates

THE MARK OF SPECIALIZED RESEARCH

GATES VULCO ROPE DRIVES
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1 **300 B.C.**—Crude elevators like this helped primitive farmers store grain in bins above ground. Hand operation was the rule though animal power, even water wheels, were used.

2 **1850**—First elevator in America operated between two floors only. Use of elevators got the first big boost in 1890's with the advent of low-cost electricity and better safety devices.

3 **1915**—Howell "Red Band" Motors arrived. These rugged, industrial-type electric motors together with safer, stronger, faster elevators ushered in the new era of *skyscrapers.*

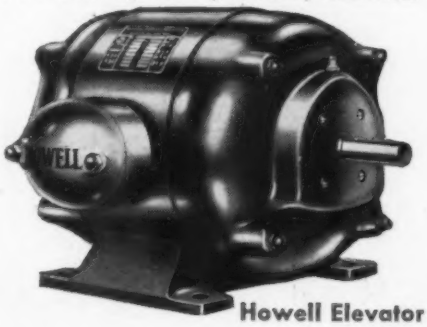
"GOING UP"—*and how!*

4 **Today** — Elevators whisk passengers up 102 stories in *seconds!* Freight elevators haul 30,000 lbs. in one load!

Credit the elevator industry with a swell job. Credit, too, Howell Passenger and Freight Elevator Motors for making good on the hard jobs. These rugged motors are specially designed for smooth acceleration, economy and quiet operation.

In other industries, too, you'll find precision-built Howell Motors an important source of power for pumps, conveyors, fans and machine tools, and other industrial jobs.

Here's another precision-built Howell Motor . . . industrial type with copper or bronze bar rotors . . . specially insulated . . . statically and dynamically balanced.



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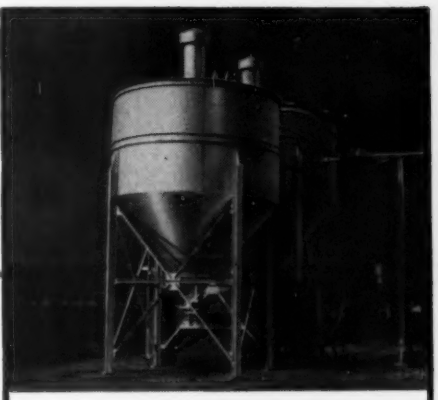

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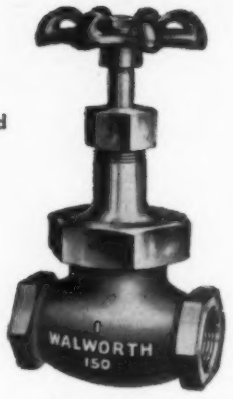
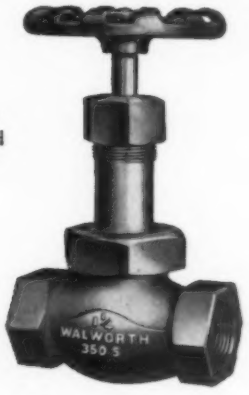


Renewable Disc

No. 225P
350-Pound
Bronze
Valve



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Iron Body
Saddle
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No. 1671F
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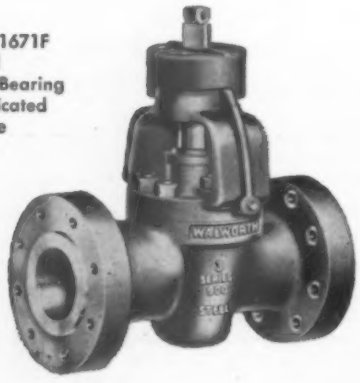
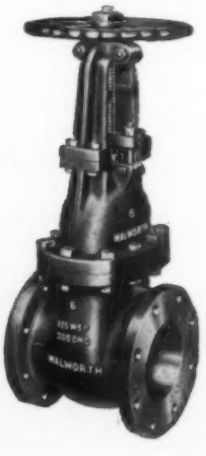


Pressure-
Seal
Steel
Valve

No. 726F
Iron Body
Wedge
Gate
Valve



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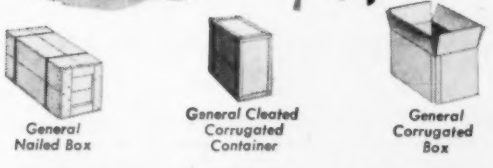
* *Statement of Nathan Bedford Forrest (1821-1877), great Confederate cavalry leader. Volunteered as private in 1861; made a major-general in 1863.*



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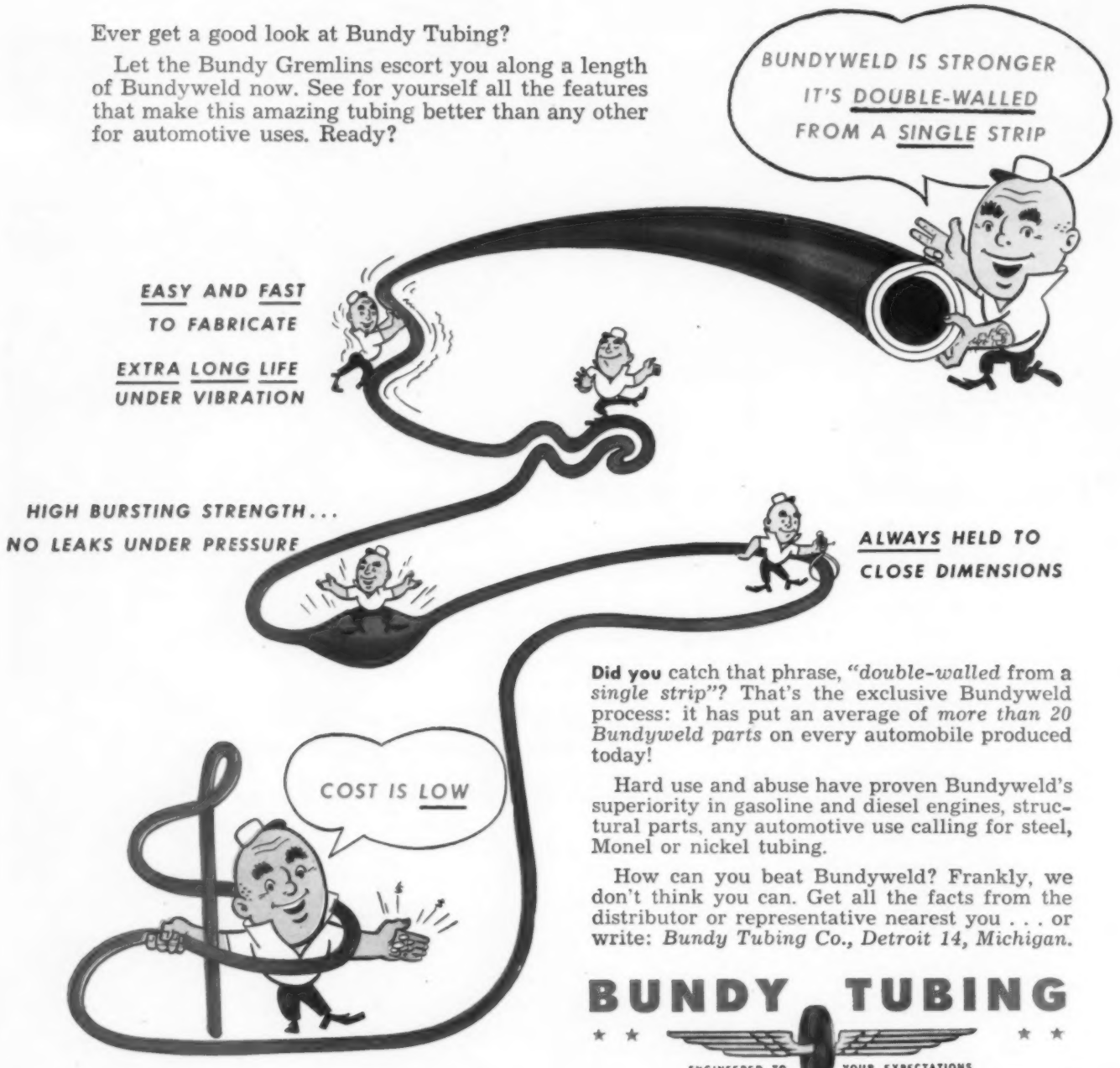

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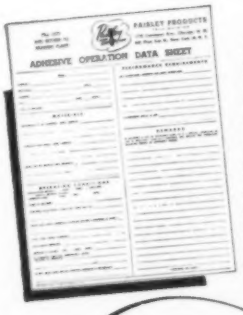

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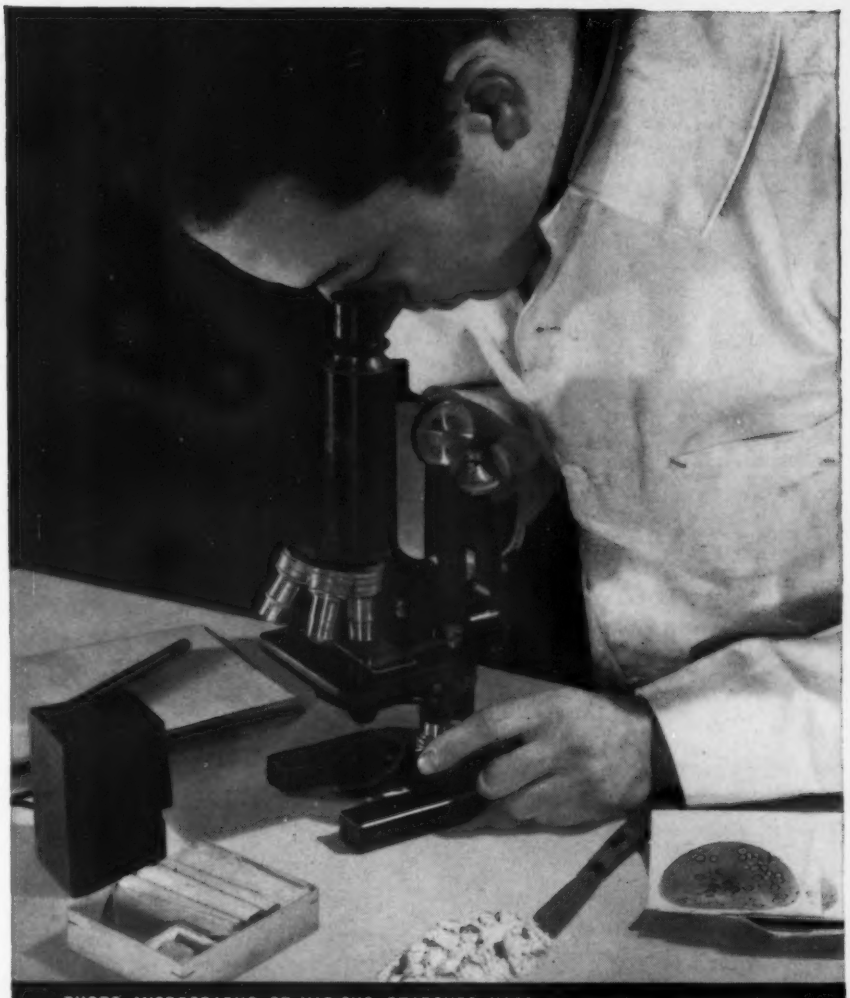
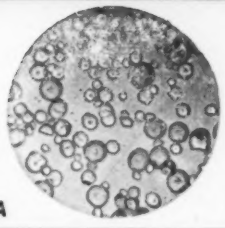


PHOTO MICROGRAPHS OF VARIOUS STARCHES USED IN ADHESIVE MANUFACTURE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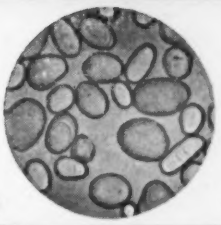
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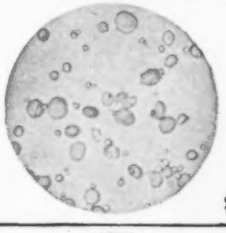
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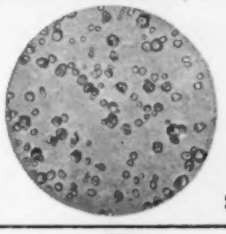
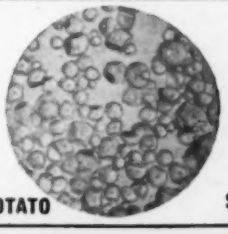

CORN STARCH

SAGO STARCH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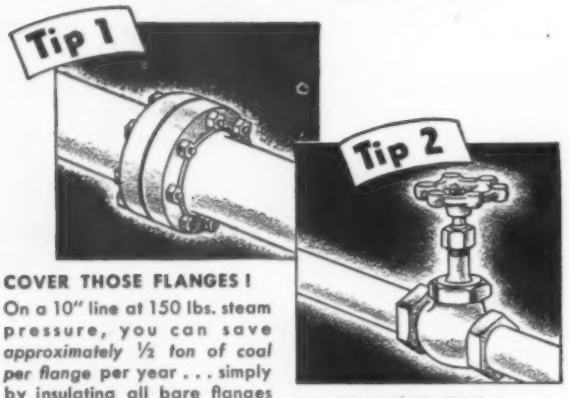

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On a 10" line at 150 lbs. steam pressure, you can save *approximately ½ ton of coal per flange* per year . . . simply by insulating all bare flanges with "Featherweight!"

COVER THESE, TOO!
Similarly, gain further fuel savings by covering all valves, elbows and other fittings in the steam lines.

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These new starting units come in four sizes to fit a wide range of motors. You can plan your own motor control center by simply taking an inventory of your motors and then adding up the space sizes of the starters needed.

Let us send you our publication GEA-4979 which will give you detailed description and ordering information. Fill in the coupon and mail it to us. Apparatus Department, General Electric Company, Schenectady, New York.

GENERAL ELECTRIC

Apparatus Department
Section No. N676-262
General Electric Company
Schenectady 5, N. Y.

Thanks . . . I'd like to have your publication GEA-4979 on the new G-E Motor Control Center. Will you please address it to me as follows:

Name .....

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Staples SETS A RECORD LOW In Carbide Reamer Prices

Announcing ECONOCUT

CARBOLOY-TIPPED CEMENTED CARBIDES REAMERS

Again, Staples Tool Company leads in reducing *metal cutting costs*—with the new line of ECONOCUT Reamers. These precision Carboloy-tipped tools are now available for immediate delivery at the *lowest prices ever announced* in circular carbide tool history!

Now you get carbide reamer economy, better hole finish, longer tool life—at greatly reduced prices. Staples has made this cost reduction possible through expanded and improved production facilities —and by standardizing ECONOCUT on straight shank tools in the most widely used size range. See your Staples Tool Distributor, or write for further information.

STRAIGHT SHANK—STRAIGHT FLUTES				
Diameter	Number of Flutes	Shank Diameter	Overall Length	PRICE
1/4"	4	15/64"	6"	$3.75
9/32	4	15/64	6	4.00
5/16	4	9/32	6	4.00
11/32	4	9/32	6	4.25
3/8	4	5/16	7	4.25
13/32	4	5/16	7	4.75
7/16	4	3/8	7	4.75
15/32	4	3/8	7	5.00
1/2	6	7/16	8	5.50
17/32	6	7/16	8	5.75
9/16	6	7/16	8	5.75
19/32	6	7/16	8	6.25
5/8	6	9/16	9	6.25

NOTE: For taper shank requirements, use standard split sleeve reamer driver. Available at moderate price.

See the Staples Tool exhibit at Booth No. 327, the ASTE Industrial Exposition, Cleveland, March 15-19.

THE STAPLES TOOL COMPANY
CINCINNATI 25, OHIO

• *write for your complete Staples Tool catalog*

Staples CARBOLOY CEMENTED CARBIDE TOOLS

A COMPLETE LINE OF SINGLE AND MULTIPLE POINT CUTTING TOOLS
EXPANSION REAMERS • FORM TOOLS • CENTERS • MASONRY DRILLS • SPECIAL TOOLS

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Acetone Content	99.5% min.
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Distillation Range	1°C. incl. 56.1°C.
Color	5 APHA max.
Acid as Acetic	.002% max.
Alkalinity as NH_3	1 ppm max.
Non-Volatile	Max. .001 gr. per 100 cc sample
Permanganate Time	2 hours min.
Aldehydes	None
Water	Less than 0.5% (miscible with 19 vol. 60° Be' gasoline at 20° C.)

A new brochure is available containing specifications and general information on many of the Celanese* organic chemicals. Write for your copy—and call on Celanese whenever you need technical assistance regarding organics.

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Chemical Division
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Acetaldehyde	iso-Propyl Alcohol
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FOR LABORATORY EVALUATION, SCHEDULED FOR FUTURE PRODUCTION:

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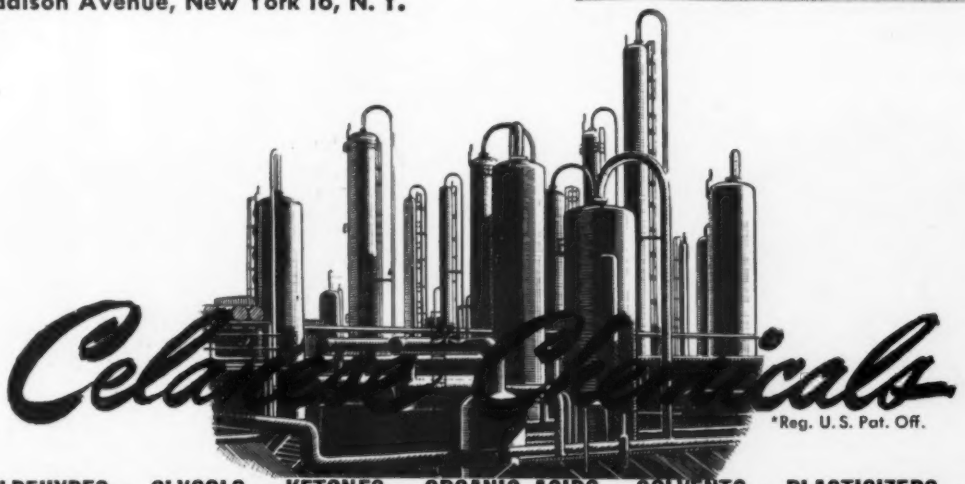
Tetrahydrofuran



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Eighty pages filled with useful, informative bearing data. This new edition lists and describes the most complete stock sleeve bearing service in the world. It includes UNIVERSAL Bronze Bars, General Purpose Bearings, Electric Motor Bearings, Graphited Bearings and Babbitt together with a wealth of valuable information.

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Years of "know-how" mean better products.
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In Federated solder you get the exact metal you specify, PLUS all these intangible ingredients. These background factors mean service and security... they mean that you get *consistently* better solder to help you do a *consistently* better job.

For any size, form, or composition of solder—bar, pig, body, drop, foil and ingot; acid core, rosin core and solid wire; triangle, strip, wiping and segment — see Federated first.

Federated
METALS DIVISION

AMERICAN SMELTING AND REFINING COMPANY
120 BROADWAY, NEW YORK 5, N. Y.

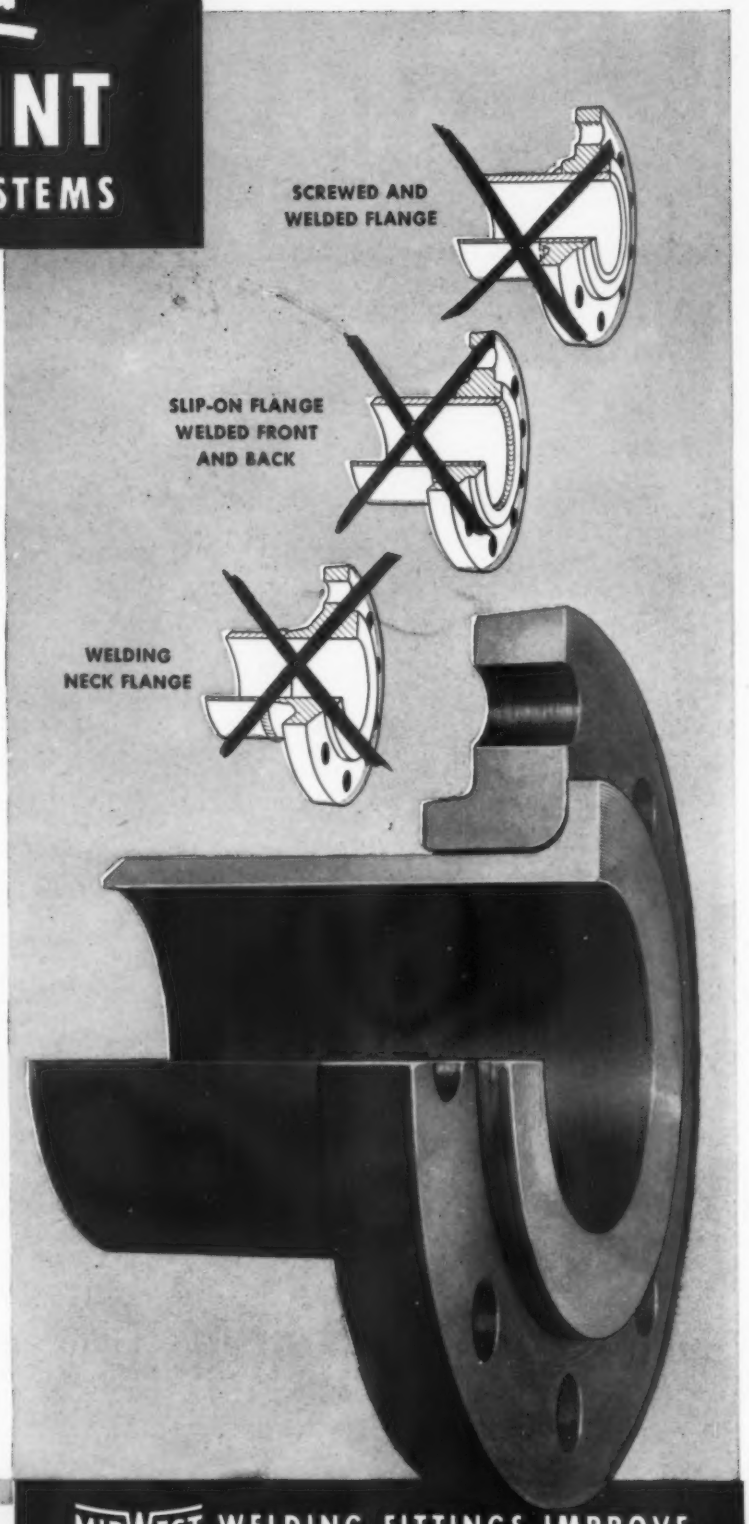
Federated first in the non-ferrous field FMD

F-CCIs

THE *Preferred* FLANGED JOINT FOR WELDED PIPING SYSTEMS

MIDWEST

LAP-JOINT STUB ENDS



For making connections to boilers, pumps, valves and other flanged outlets (and where piping must be frequently cleaned or inspected for corrosion), Midwest Lap-Joint Stub Ends have a tremendous advantage over flanges that are welded to the pipe (see drawings at right above). The swivel flange on the Stub End makes it unnecessary to accurately line up the bolt holes before welding; "setting up" is simple and quick because no special clamps or jigs are required to hold the face of the flange absolutely perpendicular to the axis of the pipe. The result is a real saving in time and cost of welding.

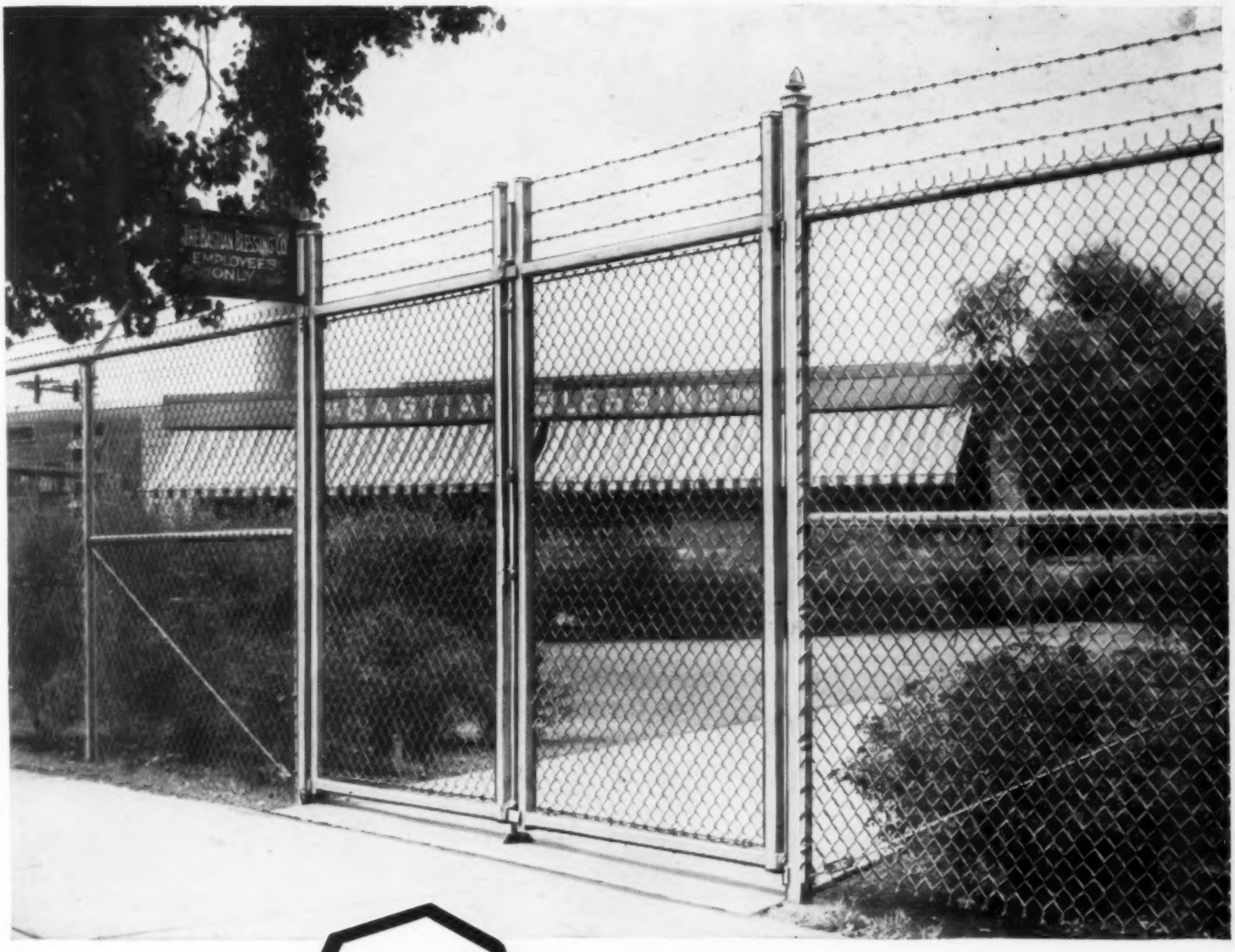
Another important economy is in erection. Field organizations report a saving of 25% in erection time for making up a joint using Midwest Lap-Joint Stub Ends in comparison with flanges rigidly fixed to the pipe; this saving is even greater when the flanges are on bends.

See Bulletin WF-41 for complete data regarding Midwest Lap-Joint Stub Ends . . . and the many other Midwest Welding Fittings that simplify and save on welded piping.

MIDWEST PIPING & SUPPLY CO., Inc.
Main Office: 1450 South Second St., St. Louis 4, Mo.
Plants: St. Louis, Passaic (N.J.). Los Angeles, and South Boston

Sales Offices: Chicago—79 W. Monroe St. • Houston—229 Shell Bldg. • Los Angeles—520 Anderson St. • New York—(Eastern Division) 30 Church St. • Tulsa—533 Mayo Building.

MIDWEST WELDING FITTINGS IMPROVE DESIGN AND REDUCE PIPING COSTS



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Like a tough, durable sentinel, an Anchor Chain Link Fence will keep your plant grounds and buildings free of trespassers, snoopers, agitators, all kinds of trouble-makers. It is made in a wide variety of heights and styles. One of our trained Anchor Fence Engineers can recommend the installation best suited to your needs.

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Extra life and greater protection are built into every Anchor Fence through several time-tested, *exclusive* features. *Deep-Driven Anchors* are an example. They are clamped to the posts at right angles to the fence line, driven deep in the subsoil to hold the fence erect and in line at all times. Ask your local Anchor branch for more details, or write for the informative booklet shown below, to: ANCHOR POST FENCE DIVISION, Anchor Post Products, Inc., 6615 Eastern Ave., Baltimore 24, Maryland.

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FREE ILLUSTRATED CATALOG

Contains structural diagrams, specification tables, installation photos of many types and uses of Anchor Chain Link Fence in leading plants all over the country.

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WHEN YOU BUY BUFFS . . .

Count your COST per Buffing Wheel

THE COST OF A BUFFING WHEEL should be determined by the diameter of the wheel . . . the number of sections needed to make any given face measurement . . . the quality of material in its construction and the hours per wheel life . . . **NOT** merely by the initial cost per section.

You can SAVE 50%

with JACKSON AIRWAY Ventilated BUFFS

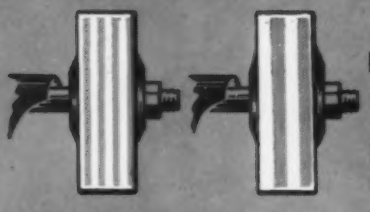
Constructed of special sheeting scientifically designed and produced by the largest textile mill in America . . . incorporating the exclusive **Jackson Airway Ventilation** in their manufacture . . . these buffs are truly the best money can buy. That is why they wear twice as long . . . eliminate burning . . . buff more work per wheel life . . . require no raking and save compounds.

FOR EXAMPLE: Why spend $10,000 a year for ordinary buffs when $5,000 will do the job if you use **Jackson Airway Ventilated Buffs.** Conclusive proof that we **SAVE YOU 50%** is yours for the asking — write, wire or phone, today!

CHECK THESE JACKSON AIRWAY VENTILATED BUFF FEATURES:

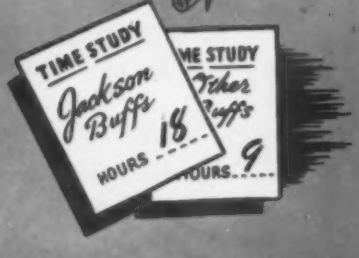
NO BURNING

Jackson patented construction incorporates full ventilation permitting air to cool the buff internally.



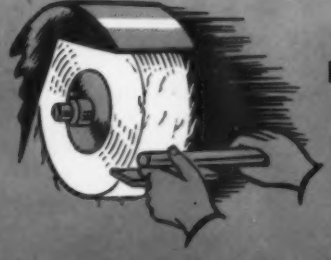
HALF AS MANY SECTIONS

Because these buffs are twice as wide as ordinary buffs, you buy half as many sections per wheel.



WEAR TWICE AS LONG

Time studies are offered as conclusive proof that they wear twice as long as conventional buffs.



NO RAVELING, SAVES COMPOUNDS

Bias construction of Jackson Airway Ventilated Buffs eliminates raveling and saves compounds.

WARNING NOTICE—Jackson Buff Corporation of Long Island City, N. Y., has rights to U. S. Patents Nos. Re 19,894 and 2,140,208 which have broad claims covering an air cooled buff having means for the admission of air through the sides of the buff. Owner intends to protect all rights and stop infringement.
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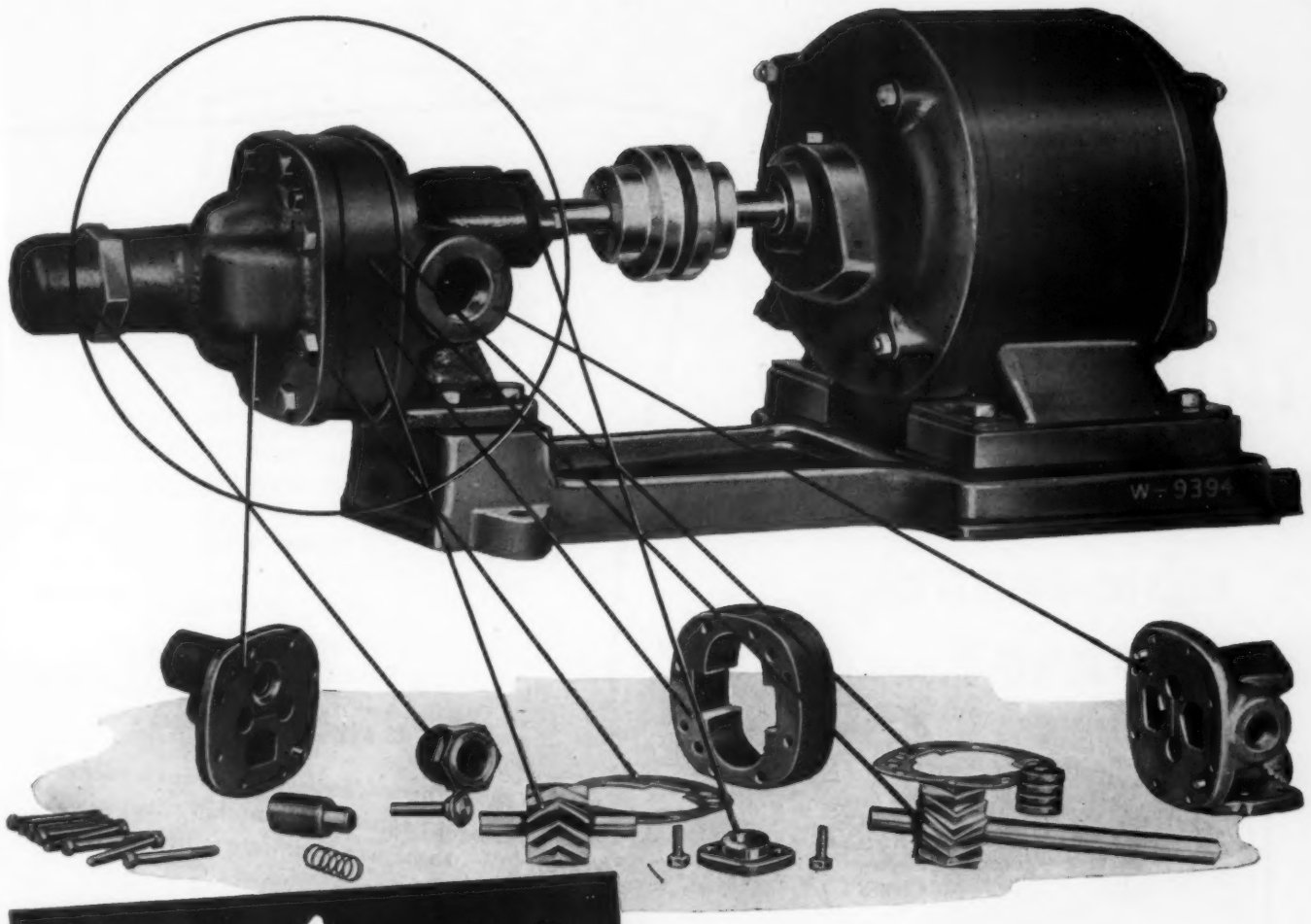

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A ROTARY PUMP YOU CAN INSTALL AND FORGET

WORTHINGTON GENERAL SERVICE TYPE GA ROTARY PUMPS *with special herringbone gear rotors*

It's the simplicity of these small-capacity rotary pumps that contains the promise of long, trouble-free service-years ahead. Only a few moving parts; quiet, efficient herringbone gears; four large, pressure-lubricated bearings. That's all there is to this simple design . . . the answer to what, Worthington Market Research discovered, you and men like you in many industries really want.

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For full specification and application data that prove *there's more worth in Worthington,* ask your nearby Worthington Distributor or Representative for Bulletin W-484-B1 . . . or write direct. *Worthington Pump and Machinery Corporation, Merchandising Division, Harrison, N. J. 36 District Offices throughout the U. S.*

WORTHINGTON

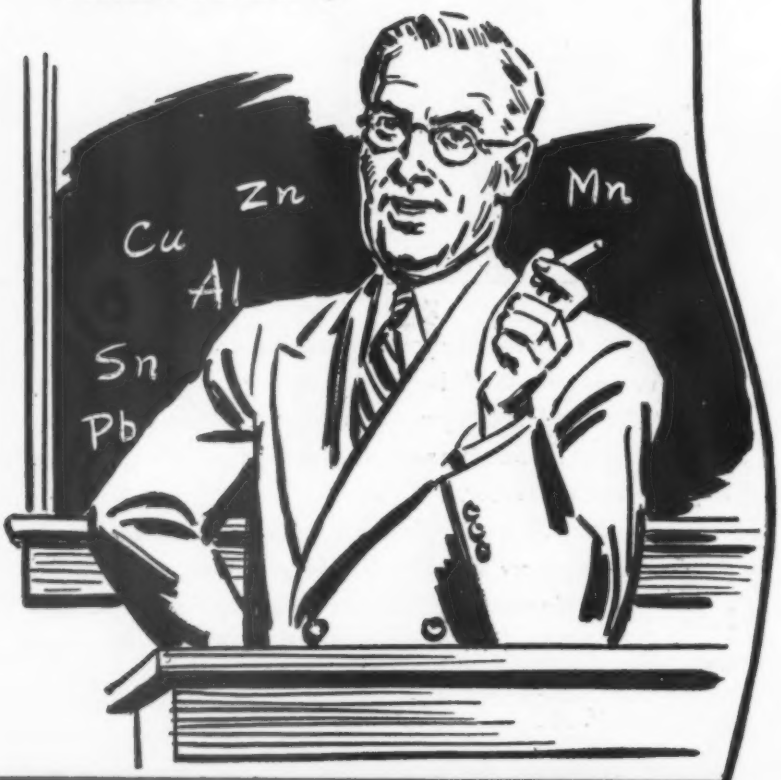
86-44

PRODUCTS BASED ON MARKET RESEARCH

Centrifugal Pumps | Rotary Pumps | Steam & Power Pumps | Liquid Meters | Vertical & Horizontal Compressors | Multi-V-Drives | Variable Speed Drives

how much do you know

ABOUT NON-FERROUS METALS?



1. ***What is the main purpose in superheating magnesium casting alloys?***

(a) To increase fluidity
(b) To eliminate impurities
(c) To improve tensile strength
(d) To prevent gas porosity

2. ***What is Tenzaloy?***

(a) A new Federated aluminum alloy that gives high strength without heat treatment
(b) A zinc-base die casting alloy
(c) A 10% magnesium-aluminum alloy
(d) A 10% silicon-aluminum alloy

3. ***Approximately how much nickel is required in a nickel silver alloy to insure complete whiteness?***

(a) 10%
(b) 18%
(c) 25%
(d) 30%

4. ***Which of the following commercial metals has the best machinability?***

(a) Brass
(b) Bronze
(c) Aluminum
(d) Magnesium

Federated
METALS DIVISION
AMERICAN SMELTING AND REFINING COMPANY
120 BROADWAY, NEW YORK 5, N.Y.

5. ***If the mechanical properties of a test bar are above requirements, it proves that:***

(a) Castings of the same metal have the same properties
(b) The castings are pressure-tight
(c) The castings are satisfactory
(d) You made a good test bar

6. ***If the same casting conditions prevail, which type of mold will give the fastest cooling rate?***

(a) Green sand (c) Plaster mold
(b) Dry sand (d) Permanent mold

7. ***What is the electrical conductivity of 85-5-5-5?***

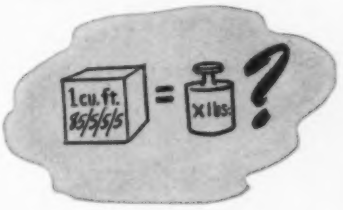
(a) 9.8% (c) 32.6%
(b) 16.4% (d) 84.5%

8. ***Which property of an aluminum alloy usually shows the greatest improvement shortly after solution treatment?***

(a) Tensile strength
(b) Elongation
(c) Hardness
(d) Impact strength

9. ***Approximately what would be the electrical conductivity of an alloy consisting of 99% copper and 1% tin?***

(a) 55% (c) 85%
(b) 75% (d) 95%



10. ***What is the approximate weight of a cubic foot of 85-5-5-5?***

(a) 450 lbs. (c) 405 lbs.
(b) 540 lbs. (d) 650 lbs.

HOW TO RATE YOUR SCORE

If you answered all 10 questions correctly, consider yourself an A-1 expert. 8 or 9 right is above average. Anything below 7 indicates that a little reading on the subject of non-ferrous metals would help considerably. Try some of Federated's easily understood literature (experts invited, too). Simply fill in and mail the coupon on this page.

If you have any foundry problems, a practical Federated service man is ready to help. Call or write any of Federated's 11 plants or 25 sales offices across the nation, or FEDERATED METALS DIVISION, AMERICAN SMELTING AND REFINING COMPANY, 120 Broadway, New York 5, N. Y.

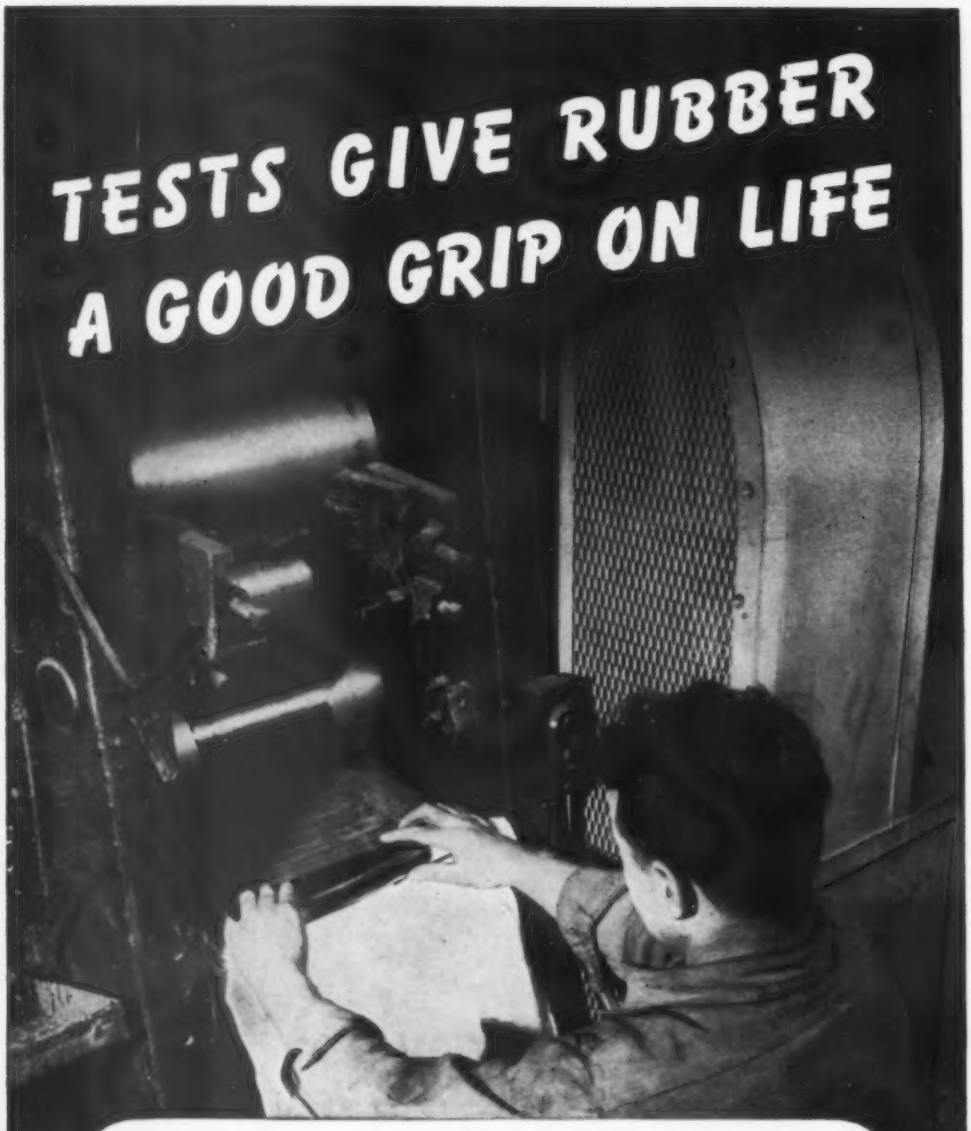
FEDERATED METALS DIVISION Dept.— P
AMERICAN SMELTING AND REFINING COMPANY
120 Broadway, New York 5, New York
Please send me the items I have checked:

- ☐ Non-Ferrous Metals and Alloys booklet
- ☐ Aluminum Casting Alloys booklet
- ☐ Test Bars booklet
- ☐ Di-Metal for Better Die Castings booklet
- ☐ Reprints of technical articles
- ☐ Tenzaloy pamphlet

Your name.....
Company name.....
Address.....
City..... Zone..... State.....

ANSWERS: 1. (c) To improve tensile strength. 2. (a) A new Federated aluminum alloy that gives high strength without heat treatment. 3. (b) 18%. 4. (d) Magnesium. 5. (d) You made a good test bar. 6. (d) Permanent mold. 7. (b) 16.4%. 8. (d) Impact strength. 9. (a) 55%. 10. (b) 540 lbs.

TESTS GIVE RUBBER A GOOD GRIP ON LIFE



The tight adhesion of rubber-to-fabric is an important factor in the long-lasting quality of belting, hose, packings. That's why Quaker technicians are constantly making adhesion tests after samples of rubber and fabric are "welded" by miniature calenders shown above, to assure a tight union.

This is only one of eighteen rigid tests that raw materials and finished products *must* pass before receiving the Quaker stamp of approval. Yes—pre-testing provides quality and long service . . . assures worthwhile dividends for you through higher plant efficiency, lower operating costs.

Call your nearest Quaker distributor for speedy service. He and the Quaker sales engineer are teamed to provide accurate recommendations on Quaker pre-tested belting, hose, packings.

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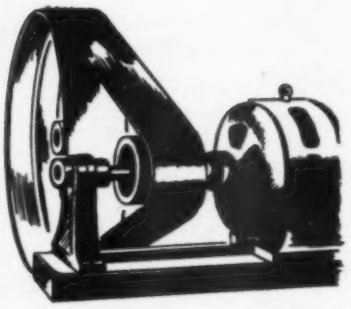
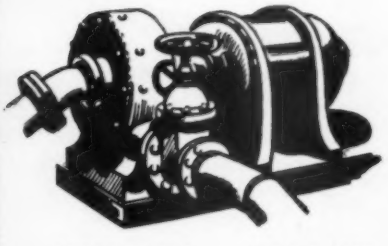


MORE POWER FOR PRODUCTION

In the complete line of Quaker transmission belts and belting pre-testing plays a vital part in providing long service, tight grip, slip-less power. Both V and flat types . . . transmission and conveyor, for all purposes.

STANDS PRESSURE, RESISTS WEAR

Quaker hose, in moulded and wrapped construction, is ruggedly built of pre-tested materials for trouble-free transmission of air, steam, water, acids, volatiles. Tight adhesion of rubber and fabric resists pressure, twisting, severe wear.



STOPS LEAKS . . . CUTS COSTS

Quaker pre-tested packings for all purposes stop hot leaks cold . . . provide tight-sealing, long lasting service for valves, piston rods, flanges. Ideal for packing against steam, water, acids, volatiles. Call Quaker for solution to your packing problems.

DRILL IT!...

Black & Decker
HOLGUN*
Drills holes up to 1/4" diameter in steel, up to 1/2" in hardwood.

TAP IT!...

Black & Decker
TAPGUN*
Cuts threads up to 3/16" in mild steel, up to 5/16" in cast iron, up to 3/8" in brass or aluminum.

DRIVE IT!...

Black & Decker
SCRUGUN*
Drives machine screws and nuts up to 1/4" diam., self-tapping screws up to #12, wood screws up to #10 x 2".

Here's the TRIPLE ANSWER to LOW-COST ASSEMBLY!

YOU can save time and money in many of your assembly operations by tooling up with Black & Decker Portable Electric Holguns, Tapguns and Scruguns! Each of these tools is *engineered* to do better, faster work; to turn out more uniform production at lower cost. Each is perfectly balanced, with the famous "Pistol Grip and Trigger Switch," for easier handling that reduces operator fatigue. Each is the product of Black & Decker's top-notch workmanship and materials that give them strength and stamina for continuous, trouble-free operation. Ask your nearby Black & Decker Distributor for details. For information on these and more than 100 other Portable Electric Tools—Drills, Screw Drivers, Sanders, Bench Grinders, Portable Grinders, Saws, Shears—write for our latest free catalog to: The Black & Decker Mfg. Co., 664 Penna. Ave., Towson 4, Md.

*Trade Mark Reg. U. S. Pat. Off.

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PORTABLE ELECTRIC TOOLS

LOOK

for the FILE that does a full time job!

25% more stock removal

PROVE IT YOURSELF

Simply clamp a 1 in. square metal bar in your vise. Take 100 strokes with a DELTA File (both sides) and collect the filings. Now do the same with your present files. Weigh the filings and compare results. Surprised? This test has convinced thousands of file users that DELTA gives better filing in less time and CUTS COSTS.

Are you interested in speeding your work, cutting filing costs to the bone, and getting double life from your files? Then DELTA Files are for you.

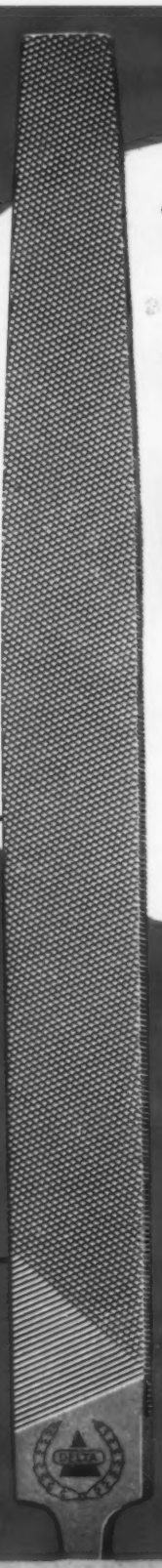
Actual scientific tests prove that a DELTA File will remove, on the average, 25% *more* metal in the same time with the same effort.

And there are thousands of extra strokes in every DELTA File. In a recent test a DELTA File outlasted a well-known file two to one.

This proven superiority results from each tooth being precision-made to dig deep into metal and to do it long after other files are no longer useful.

There's a steady, efficient bite in every stroke of a DELTA File that means a smooth, fast finish to your work.

- FOR LONGER *FILE LIFE*
- FOR GREATER PRODUCTIVITY
- FOR LABOR SAVING



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Grandma knew all about combustion . . .

CITIES SERVICE

"A CLEAN LAMP burns brightly," that was enough for Grandma. She knew how to get the best performance out of a lamp even if she couldn't explain combustion in her own words.

She knew it had something important to do with cleanliness. "Keep it clean," she would say, "And you'll get the best results. It's as simple as apple pie."

Cleanliness is still the watchword of efficient combustion but the problems of "soot" (combustion residue) in today's high powered internal combustion engines are not as simple as apple pie. Today residual materials *must be* removed by arduous hand cleaning operations or by specially *developed solvents.*

Two such solvents are Cities Service Cisco Pep and Cities Service Cisco Solvent. These two products, developed in the laboratories of Cities Service, are daily saving costs in fuel, reducing maintenance expense and improving the efficiency of countless varieties of internal combustion engines.

Cisco Pep, designed for lubricating the upper cylinder area of engines and freeing valves and rings, also leaves a protective lubricant film on the cleansed surface. Cisco Solvent working on the crankcase zone removes and flushes away harmful sludge, "carbon" or abrasive material.

For further information, or a free demonstration on your equipment by a Cities Service combustion specialist *(in the Cities Service marketing territory East of the Rockies)* write Cities Service Oil Company, Sixty Wall Tower, Room 72 New York 5, N. Y.

CITIES SERVICE OIL COMPANY

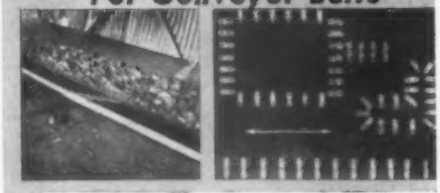
NEW YORK • CHICAGO

In the South: ARKANSAS FUEL OIL COMPANY

Present Day Practice in Belt Fastening

Every man who has anything to do with the purchase, application or maintenance of conveyor, transmission or V-belts will find the bulletins listed below of considerable value in connection with belt fastening work. A knowledge of present day practice in belt fastening helps reduce the loss in machine hours due to belt failures caused by the use of the wrong type of fastener or improper application. We shall be glad to send any or all of them to you or to any of the men in your organization.

For Conveyor Belts



FLEXCO HD Belt Fasteners are used to make a "water-tight" butt joint in conveyor belts ranging from ¼" to 1½" thick and of any width. The view on the right shows the various types of rips that can be repaired with these fasteners and Flexco HD Rip Plates.

Bulletin F-100 gives complete details on how to fasten and repair conveyor belts.

For V-Belts

ALLIGATOR V-Belt Fasteners are now being widely used to fasten B, C and D, open-end V-belting of cross woven fabric core construction now being made by most belting manufacturers. The view at the left shows a typical application of these fasteners to a drive where endless V-belts would require dismantling the machinery to put the belts on the sheaves.

Bulletin V-205 gives complete instructions on how to use V-belt fasteners.

FLEX V Fasteners for A and B belts are also available for lighter duty V-belt drives. Ask for **Bulletin V-14.**

For Transmission Belts

ALLIGATOR Steel Belt Lacing is in world-wide use to make smooth, flexible joints in leather, rubber, balata, stitched canvas or solid woven belts up to ⅝" thick and as wide as they come.

Bulletin A-60 tells how to fasten and repair transmission belts.

Sold by Supply Houses Everywhere

FLEXIBLE STEEL LACING COMPANY
4697 Lexington Street, Chicago 44, Ill.

F.O.B. Philosophy of Buying

A COUPLE of months ago, we had occasion to chide the American Management Association for its failure to include purchasing among the basic management functions in setting up its conference schedule. It is only fair, therefore, to commend the National Industrial Conference Board for featuring a session on purchasing at its January meeting. It was NICB's 293rd meeting, and the first time that the buying function had been so recognized. Progress comes slowly, but surely.

• •

HERE'S a tip for AMA: The Waldorf's Basildon Room, to which the round table session on purchasing had been assigned was really filled to capacity. The Standing Room Only sign was up, and the customers were lined up against the wall. "Increasing the Efficiency of Industrial Buying" was the topic, ably handled by a quartet of competent speakers: George Renard of N.A.P.A., Wally Skuce of Owens-Corning-Fiberglas, Vince Goubeau of RCA Victor, and Vic Lottman of Ford.

• •

SALESMEN, beware! A new occupational hazard has been added. The story goes back to an advertisement appearing in these pages on behalf of the Doehler-Jarvis Corporation, die casting specialists, who illustrated their point about the sharp detail and fine surface finish of their process by showing pictures of a toy pistol, before and after. With professional courtesy, they included a credit line to their customer whose product was illustrated: "Samples furnished through courtesy of Kilgore Manufacturing Co." You can guess the rest—how the line was misconstrued by many of our readers, avid students of the advertising pages, and how it brought to the surface the eternal boy that lives on in the heart of the grown man. The requests for sample toy pistols began to pour in upon the astonished advertiser, who had foreseen no such reaction to his message, and was scarcely equipped to cope with the unexpected demand. Presently the misunderstanding was traced to its source, and the ambiguous line has been deleted from subsequent insertions. Meanwhile, this explanation is offered as a warning to the salesman who may be startled to see a shining die-cast "Mountie" repeater casually reposing on the buyer's desk.

• •

WE ARE not alone in our contention that the teaching of management and marketing subjects has not always kept pace with the changes and developments of industrial practice (*The ABC of Purchasing, The XYZ of Purchasing,* etc.). Nor are we alone in suggesting ways and means of effecting a closer liaison. In the January 23rd issue of *Printers' Ink* is an interesting story on how the Curtis Publishing Company has approached the problem. According to Donald M. Hobart, director of research for Curtis, "educators have repeatedly demonstrated their inability to keep abreast of the flow of advertising, research and promotional materials that constantly stream from business in the normal course of its activities. The teachers found they had no direct access to this wealth of pertinent data." His answer was to prepare a monthly compilation of such informative material developed by his company and available on request, and to add 264 teachers of marketing to his mailing list. Seventeen of these lists have subsequently been issued. To the credit of the educators, he reports that "the response to the offer was immediate, enthusiastic, and continuing". From the most recent mailing, 266 separate requests were filled. During the year and a half since the plan was inaugurated, material has been furnished to 124 universities, colleges, and schools in 42 states. This is a most encouraging report for everyone interested in better education for business.

FURTHER information of value to the practical student of business, whether in school or in actual practice, will soon become available, perhaps by late summer, as the returns come in on the new Census of Manufactures and are tabulated. The questionnaires were mailed in January. This will fill an important gap in our current statistical information, for the most recent previous census of manufacturing industry is that of 1939, and it is obvious that enormous changes have taken place since that time. Whole new industries have come of age in this period, such as synthetics, electronics, frozen foods, and others, and the trends of growth, new enterprise, and economic concentration will merit serious study on the basis of the new figures. It will be our first authentic overall picture of the postwar industrial world and it should be interesting in both its qualitative and quantitative revelations.

• •

ESTIMATES, or guesstimates, of the business situation depend on accurate information and experienced judgment for their accuracy. In a previous column, we suggested that the forecasters might blush if actual developments were measured against predictions. At least one forecaster has confounded that statement. President Cola G. Parker of Kimberly-Clark Corporation was asked at the 1947 N.A.P.A. convention to offer a figure on paper production for January. Last June, when the question was asked, demand was far in excess of supply, but Mr. Parker opined that the two would be in balance by January, and that, predicated on a hoped-for import of 3,700,000 tons of newsprint, there would be a 25 million ton supply for the year, or approximately 350 pounds of paper for every man, woman, and child in this country. The official figures as of January are as follows:

U. S. Production	21,400,000	tons
Imports (net)	3,699,000	"
Total supply	25,099,000	"
U. S. Population	144,000,000	
Per capita supply	348.6 lbs.	

According to the office mathematician, this makes Mr. Parker just about 99.6% right, and we are willing to concede him a bulls-eye.

• •

OPTIMISTIC purchasers, borrowing labor's terminology, are referring to GE's price reduction announcement as "the first round".

"HERCULES"
RED-STRAND
Flat-Laced
WIRE ROPE SLINGS
LESCHEN
WIRE ROPE
The design and make-up of this six part, flat, belt-like sling provides greater flexibility . . . more resistance to kinking . . . easier handling . . . larger and smoother supporting area . . . longer life . . . maximum safety.
A. LESCHEN & SONS ROPE CO.
5909 KENNERLY AVENUE • ST. LOUIS 12, MISSOURI

"HERCULES" *Flat-Laced* SLINGS

"HERCULES" Flat-Laced Slings consist of a flat body made with six parts of "HERCULES" (Red-Strand) WIRE ROPE laced together—not braided. The end loops are self-supporting without the use of thimbles or servings. The design of these slings provides the following features:—

1. **No shearing action under load pressure.**
2. **Load pressure is distributed over a greater area than is the case when a round bodied sling is used.**
3. **The flat, wide body section results in less wear to both the sling and the load.**
4. **The construction of the body section provides greater flexibility and more resistance to kinking.**
5. **As loops require no thimbles or servings, the cost is reduced and needless weight is eliminated. This feature also makes for easier handling through "tight" spaces.**

The above features combine to provide easier handling . . . longer life . . . greater safety. These Slings are suitable and highly efficient for handling loads of various weights under a wide range of conditions.

Description Bulletin No. FLS-48 will be sent upon request.

MADE ONLY BY
A. LESCHEN & SONS ROPE CO.
WIRE ROPE MAKERS — ESTABLISHED 1857
5909 KENNERLY AVE. — ST. LOUIS 12, MO.

NEW YORK • 90 West Street
CHICAGO • 810 W. Washington Blvd.
DENVER • 1554 Wazee Street
SAN FRANCISCO • 520 Fourth Street
PORTLAND • 914 N. W. 14th Avenue
SEATTLE • 3410 First Avenue South

EATON PERMANENT MOLD GRAY IRON CASTINGS Fulfill Critical Requirements in a Long List of Distinguished Products

For those critical applications where a dense, non-porous structure is an essential characteristic, Eaton Permanent Mold Gray Iron Castings offer worthwhile advantages. High tensile strength, freedom from leakage under pressure, freedom from distortion, and ability to take a high, mirror-like finish recommend Eaton Permanent Mold Castings, particularly for refrigeration and hydraulic applications. Free machinability makes for maximum production speed with a high percentage of perfect parts.

EATON
MANUFACTURING COMPANY
FOUNDRY DIVISION
9771 French Road • Detroit 13, Michigan

Precision Repairs

For Precision Equipment

Oxweld
PREST-O-WELD
PUROX

Oxy-acetylene equipment made by Linde doesn't ask to be "babied" but regular maintenance is the key to trouble-free operation of all mechanical equipment—oxy-acetylene equipment included. It never pays to postpone its care or do a halfway job. Welding and cutting apparatus in need of repair is wasteful of gases and time. It may also create a fire hazard in your shop. If your equipment has been improperly operated or carelessly handled, it may need repairs that cannot be made in your shop without special tools.

Take advantage of Linde repair service and be assured of a factory-quality job—get a complete overhaul, genuine parts, skilled workmanship, and expert inspection and testing at minimum cost. This service is as near as your Linde office or it is available through your jobber, who will gladly forward your apparatus to the nearest of Linde's more than 30 factory-supervised repair stations.

The words "Oxweld," "Prest-O-Weld," and "Purox" are registered trade-marks.

THE LINDE AIR PRODUCTS COMPANY

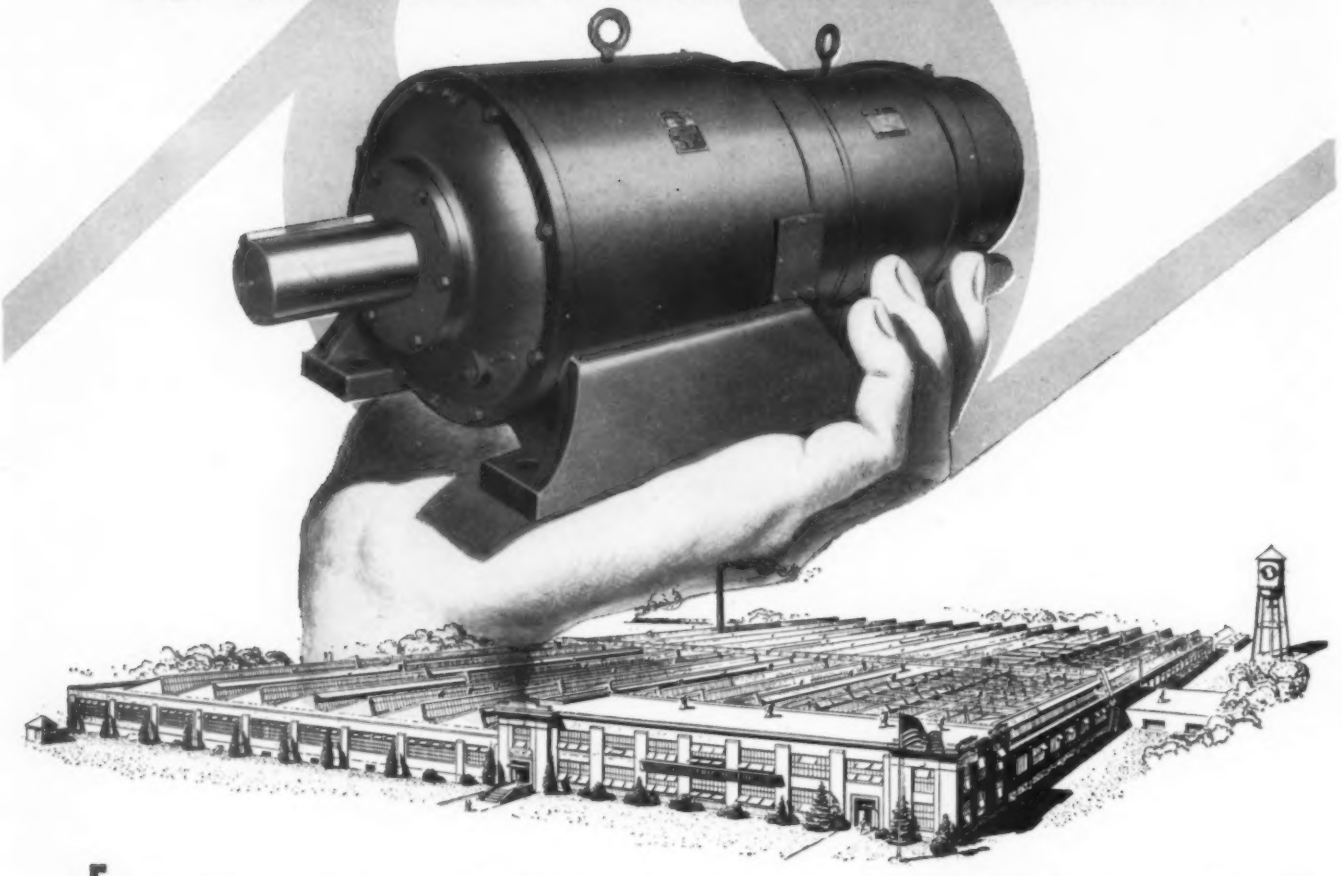
Unit of Union Carbide and Carbon Corporation

30 East 42nd St., New York, N. Y. UCC Offices in Other Principal Cities

In Canada: DOMINION OXYGEN COMPANY, LIMITED, Toronto

STAR GEARMOTORS

EVERY PART STAR BUILT
TO GIVE YOU CONTROLLED QUALITY



EVERY PART of a Star Gearmotor is perfectly suited to every other part . . . in design, dimension and quality. Motor, gears and all major components are made under the single exacting control of the Star plant.

A major aim of this control is *extra endurance* in every part of the unit, *whatever the rating may be.* Users see the result in an extra stamina that meets unexpected strains . . . a margin of safety that often removes the need to use a larger size merely to be on the safe side.

If your Gearmotor needs are exacting, you'll find the designing know-how you want at Star. For more facts, write Star Electric Motor Company, 200 Bloomfield Ave., Bloomfield, New Jersey.

7 STAR FEATURES

1. Center spacing of gears is constant . . . no need to change parts other than gears to change speed ratios.

2. Integrated design avoids a coupling between gear unit and motor . . . promotes compactness and simplicity.

3. Motor pinion is pressed onto motor shaft. No need to replace shaft when replacing worn gear.

4. All motors have anti-friction bearings . . . ball or roller bearings according to the reduction step.

5. Liberal use of materials throughout, and use of an extra tough gear metal, imparts exceptional strength.

6. Where a mounting problem cannot be solved with standard types, Star's welded steel construction permits a solution at reasonable cost, and prevents delay.

7. Wide flexibility is found in a complete line of gearmotors: ¼ HP to 75 HP . . . all cycles, phases and frequencies . . . gear reduction range from 2½ to 1 up to 100 to 1 . . . planetary gear, parallel shaft and right angle drive units . . . all types available with Star Built-in Disc Brakes.

STAR MOTORS

POWER PACKAGED AS YOU NEED IT

Purchasing Previews

A Washington Report . . . . . for Purchasing Agents

March 1, 1948

WAGE PATTERN AND ERP TO SET THE PACE . . . .

There is considerable indecision as to how business will shape up for the remainder of the year. This feeling is similar to that of the early part of 1947, with the principal exception that then there was a tendency to hang back and wait to see what would happen. Now, the uncertainty is there, but buyers and sellers are freely making commitments to insure delivery.

Two factors that will dispel the indecision are slated to be settled during the next several months. A new and higher wage pattern will be worked out—the third round of wage increases, which already is considered a matter of course. The question is how much—not if. The second is the European aid program. Here again, it is a question of amount, rather than intention.

Higher wages will bolster domestic demand for goods, and foreign aid will expand the capacity of European buyers to purchase our farm and industrial products. However, until these questions are settled, there still remains a large area of doubt as to business conditions.

In the meantime, the pressure of politics makes decisions in the economic field harder to make, and to take.

PRODUCTION AND SALES LIKELY TO ADVANCE . . . .

Higher wages and the European aid program are expected to recreate conditions that prevailed during the last three quarters of 1947—possibly to an even greater degree.

Manufacturers' margins would be narrowed even further, but production and sales volume in many lines may increase.

As long as production remains high, tendency of manufacturers will be to absorb as much of the increase in wages and other costs as possible—to compensate by seeking volume sales. In other lines where output is sufficient to meet demand, the trend will likely be similar to that which developed in the shoe industry.

There, with wages and leather high, the unit sale price was raised considerably even while the industry was producing at top capacity. When the output was dropped by approximately 20% on the basis of a more normal buyer demand, unit production costs increased, and this constituted a further pressure on the selling price.

HOUSING AND AUTOMOTIVE GOING STRONG . . . .

Industries to watch are home construction, automotive, and clothing. New home construction creates a demand for new consumer durable goods—refrigerators, dishwashers, heating plants, furniture and housewares.

Outlook is for a large number of housing starts this spring, in view of the Federal Housing Administration program to guarantee the financing of three-quarters of a billion dollars under the emergency construction program. This pro-

gram permits the Government to guarantee mortgage loans based on current costs of construction.

Strong sentiment has developed to discontinue the emergency mortgage guarantee program in favor of a return to normal considerations of housing finance. The emergency program actually underwrites the higher costs of construction, and has been a strong factor in the inflation of building material prices.

In the automotive field, the demand is still solid, although used car sellers are becoming somewhat shaky on the number of new cars which they have been accumulating to resell at premium prices. Used car sellers recently have, in effect, been buying new cars at higher than normal sales prices to protect their investments in cars already on their lots.

This situation will tend to break the gray market in cars sometime during this year, but consumer demand is still strong, with the automotive industry actively seeking to purchase increasing tonnages of materials to boost their production still further.

In clothing, the general acceptance of the new women's fashions will mean a good season in the women's wear field, and a stable demand for men's clothing is expected, based on the peak employment and high wage rate cycle.

VOLUNTARY AGREEMENT PROGRAM STILL NEBULOUS . . . .

There is still considerable skepticism concerning the role of voluntary agreements in stablizing the economy.

If there is a large European aid program, objective of the agreements will be to make available sufficient tonnages of steel to industries supplying the needs of the program—and also sufficient steel for such other industries as are considered of "prime national importance". The four steel consuming programs of prime national importance are the construction of new freight cars, production of agricultural equipment, petroleum production and transporation, and consruction of smaller homes.

Office of Industry Cooperation plans to work out steel usage in such a way as to channel more steel to the four programs without disrupting other industries. Idea is to get as much steel production as possible, by assisting in moving scrap to the mills.

Also where construction steels are not available for home building, industry would be asked to defer new industrial construction.

A program of conservation and material substitution would also result in some saving of steel.

Until a definite export program is decided upon, the voluntary agreements won't mean much—merely agreements to agree on something, if and when necessary.

WHAT IS "SMALL BUSINESS"? . . . .

One of the thorny questions of the war and postwar period has been resolved by President Truman—namely, what is to be considered small business. The term has been widely used and loosely mouthed; yet all during the war, while Government was giving aid to small business, there was no clear-cut definition of what it meant. In some industries, a 500-man plant would be considered small—while in others, it would be large indeed.

Now, President Truman has directed that in defining small business, consideration should be given to the relative size and position of the business in relation to the industry, the nature of its area of operation, the size of the group supplying capital and holding ownership and control, and the independence of its management.

As an alternative to this yardstick of smallness, the President suggests that if a business is not dominant in its field, or if a manufacturing establishment has 100 employees or less, or if a wholesale establishment has less than $500,000 annual net sales volume, or if retail has annual net sales of less than $100,000—it's a small business.

HOW AUTO MAKER CUTS SHIPPING COSTS

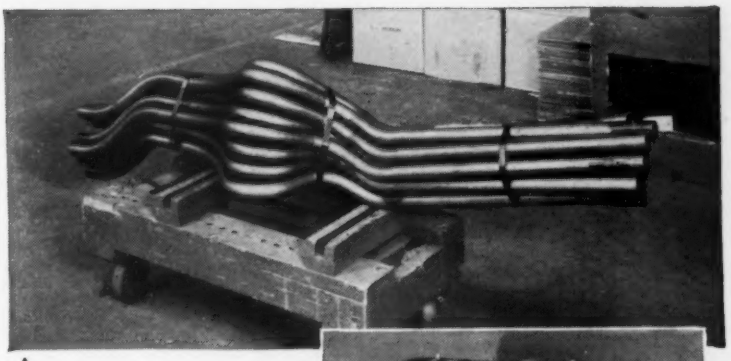
Nash Motors Division uses low-cost Acme Steelstrap to speed units to production line.

The Milwaukee Parts Plant, Nash Motors, Division of Nash-Kelvinator Corporation, relies upon Acme equipment and material to handle its bulk packing problems.

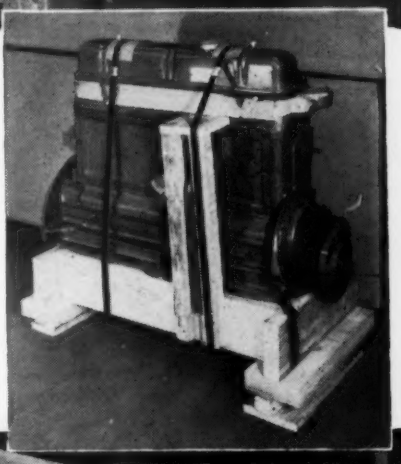
Acme Shipping Specialists helped Nash engineers devise packing operations that materially reduced costs and facilitated movement and safe shipping of units between plants. (See the three examples of better shipping at lower cost on this page.)

Acme Shipping Specialists will be happy to consult with your company on specific or general problems of packing and shipping. They can help you, and without obligation.

Find out how Acme Steelstrap users in many industries now show a *profit* in their shipping rooms. Send for free case history booklet, "SAVINGS IN SHIPPING."

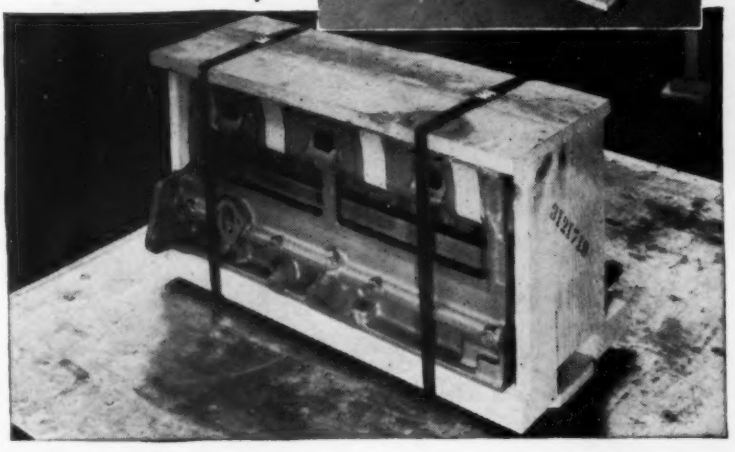


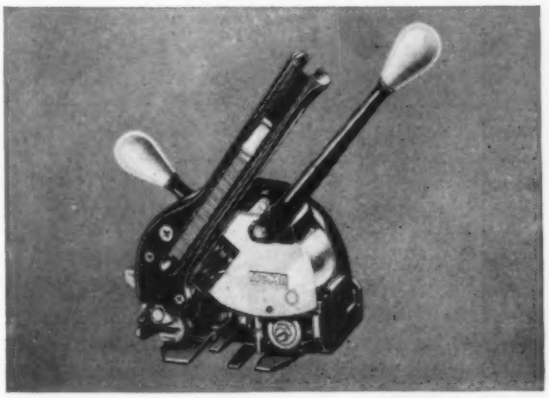
50% SAVED! Acme Uni-Pak, in which a bundle of tailpipes is wrapped with three bands of Acme Steelstrap, reduced packaging costs about 50%.



BETTER! Acme Steelstrap holds wood members in place and helps protect breather pipes. Steelstrap and two short pieces of strip steel firmly hold engine to skid.

75% SAVED! Present cost of packaging Nash engine cylinder blocks with Acme Steelstrap is only 25% of old method . . . labor and material saved!





NEW! More savings ahead with *Acme No. 3 Steelstrapper* —the lightest tool made. Magazine holds 100 seals. Tensions, seals, and cuts the strap in one operation. Small base requires only 5-inch strapping surface. Two levers working in opposite directions make for excellent balance and easy handling.

Acme Steelstrap

NEW YORK 17 ATLANTA CHICAGO 8 LOS ANGELES 11

MAIL THIS COUPON TODAY!

Acme Steel Company, Dept. P-38
2838 Archer Avenue
Chicago 8, Illinois

Please send me a copy of your case history booklet, "SAVINGS IN SHIPPING."

Name.....

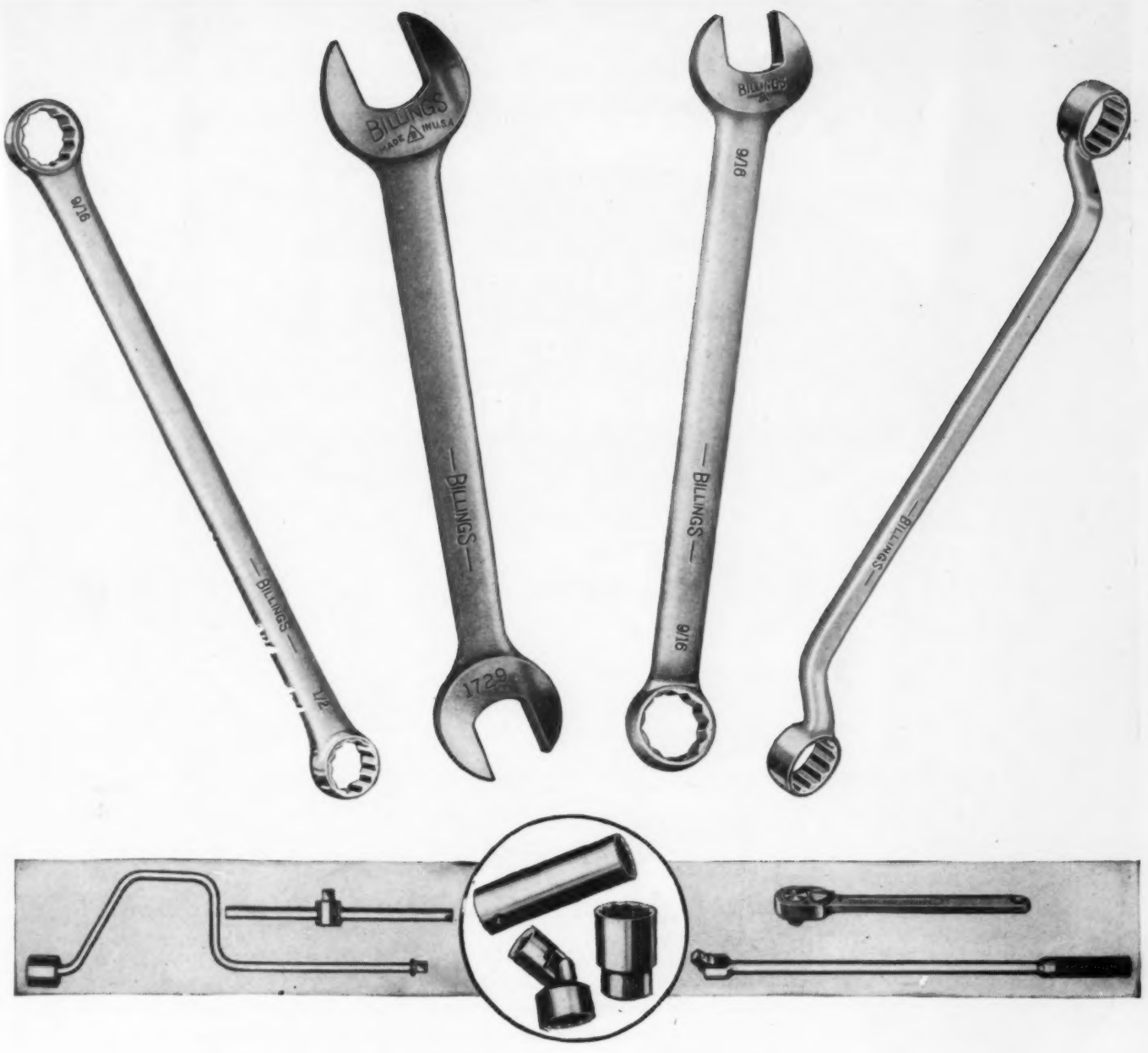
Company.....

Address.....

City..... Zone.... State.....

ACME STEEL CO.
CHICAGO

IN CANADA: Veeder-Root of Canada, Ltd., 955 St. James St., Montreal 3. IN ENGLAND: Veeder-Root Ltd., Dickinson Works, 28 Purley Way, Croydon, Surrey.

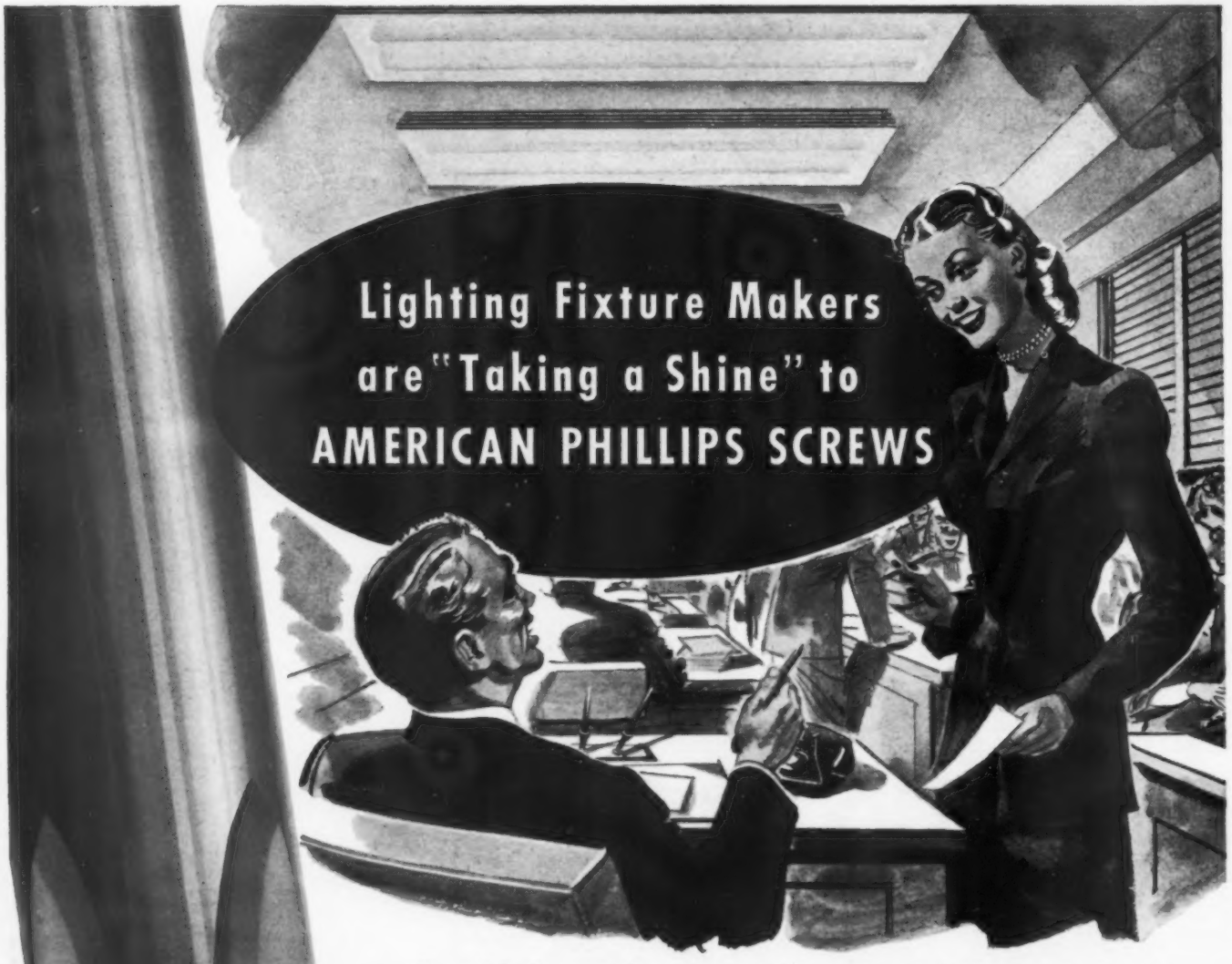


more and more
in wrenches
the name is

BILLINGS
WRENCHES

Buy Billings from
Industrial Supply Distributors

THE BILLINGS & SPENCER CO., HARTFORD 1, CONNECTICUT, U. S. A.



...that Lighten the Cost Picture—Brighten Sales!

IN PRODUCTION—You'll get *new light* on assembly speeds when fumble-proof, slip-proof, damage-proof American Phillips Screws are on *your* job! These automatically straight-driving screws are a big answer to the demand, "We must have *more* production." And an equally big answer to "We must have *lower* costs"—because this *modern* method of fastening offers TIME-SAVINGS UP TO 50%!

IN PROMOTION—American Phillips Screws are the quality, high style fastening . . . in keeping with the rest of your product's sales-slanted design. The decorative *unburred* heads are eye-catchers (not clothes-catchers). They promise and *deliver* solid serviceability from here on in. Whether you make lamps or laundry equipment, boats or bicycles, your product can profit by your writing:

AMERICAN SCREW COMPANY, PROVIDENCE 1, RHODE ISLAND

Chicago 11: 589 E. Illinois St. *Detroit 2:* 502 Stephenson Building

AMERICAN PHILLIPS *Screws*

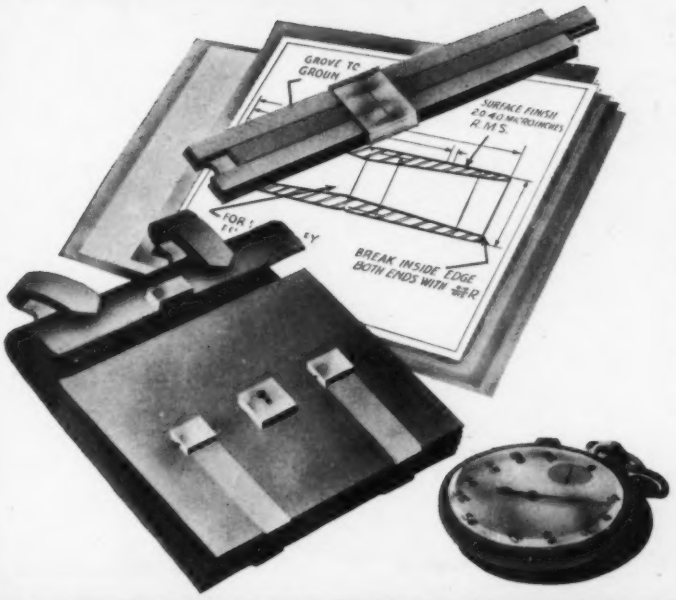
ALL TYPES

ALL METALS: Steel, Brass, Bronze, Stainless Steel, Aluminum, Monel, Everdur (silicon bronze)

A BUYING GUIDE FOR ABRASIVES

ABRASIVE PROBLEM:
Is there a direct means for Solving Unusual Technical Problems?

ANSWER BY
CARBORUNDUM
TRADE MARK



When faced with unusual or difficult problems involving grinding, sanding or finishing . . . it is becoming the accepted practice of an increasing number of abrasive users to "Call in CARBORUNDUM."

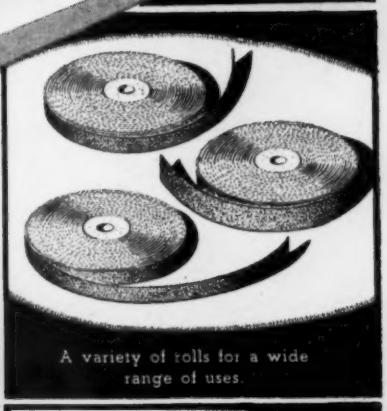
Our sales engineers are well equipped, through training and experience, to offer intelligent suggestions on specific abrasive applications and techniques. The information they pass on to both operators and production management is especially helpful. This is reflected in the preference expressed toward abrasives by CARBORUNDUM.

The Carborundum Company, Niagara Falls, New York.

CARBORUNDUM
TRADE MARK

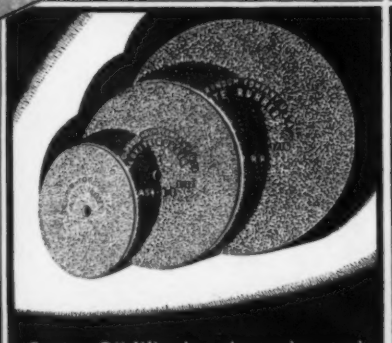
BONDED ABRASIVES
COATED ABRASIVES
ABRASIVE GRAINS AND FINISHING COMPOUNDS

Tool Room sticks and stones that cut fast . last long . and hold their form.

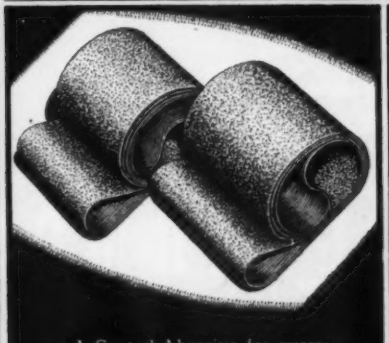


A variety of rolls for a wide range of uses.

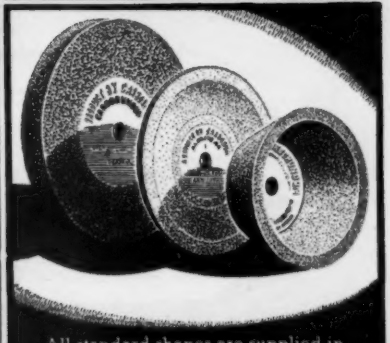
"Carborundum" is a registered trademark which indicates manufacture by The Carborundum Company



Cutting-Off Wheels . . . the modern tool for faster, less costly, more finished cuts.



A Coated Abrasive for every sanding and finishing condition.



All standard shapes are supplied in grinding wheels by CARBORUNDUM.

the RIGHT *horsepower*

Available in sizes from 1/10 to 100 horsepower.

the RIGHT *shaft speed*

Gear reduction ratios range up to 432 to 1.

and RIGHT *where you want it*

Master Gearmotors, available in millions on millions of combinations of types and ratings, permit you to use a power drive on each job that's just right . . . a power drive that will add greatly to the compactness, appearance, and economy of each of your applications.

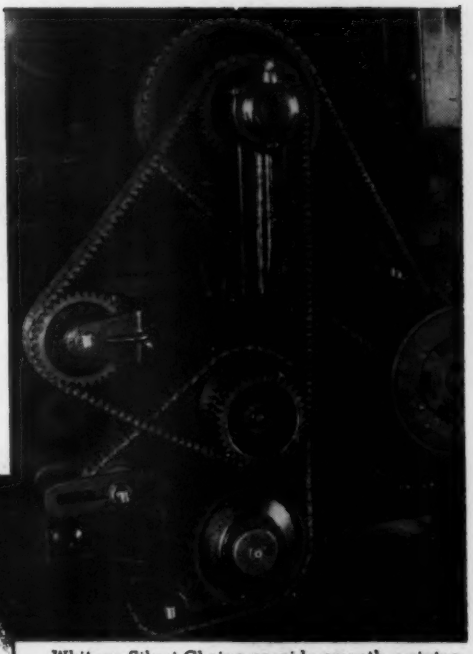
Use Master Gearmotors to increase the saleability of your motor-driven products . . . improve the economy, safety, and productivity of your plant equipment. They're the horsesense way to use horsepower.

MASTER GEARMOTORS

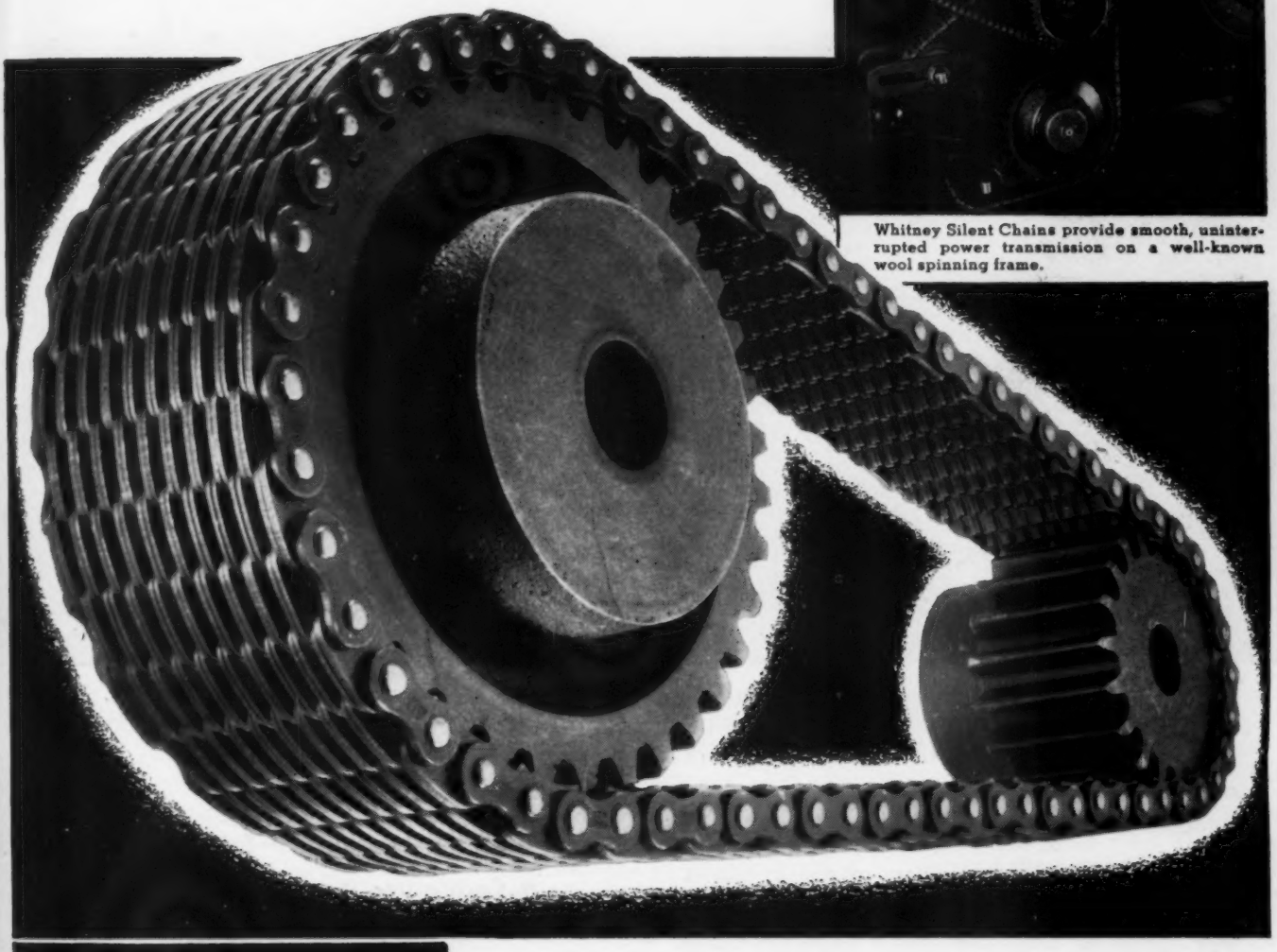
THE MASTER ELECTRIC COMPANY · DAYTON 1, OHIO

Preferred Power Drive

IN MACHINE DESIGN



Whitney Silent Chains provide smooth, uninterrupted power transmission on a well-known wool spinning frame.



Whitney Silent Chains...

Because Whitney Silent Chain Drives are unusually flexible and adaptable to a wide variety of designs, they will simplify your power transmission problems, whether it be in textile machinery, processing equipment or machine tools.

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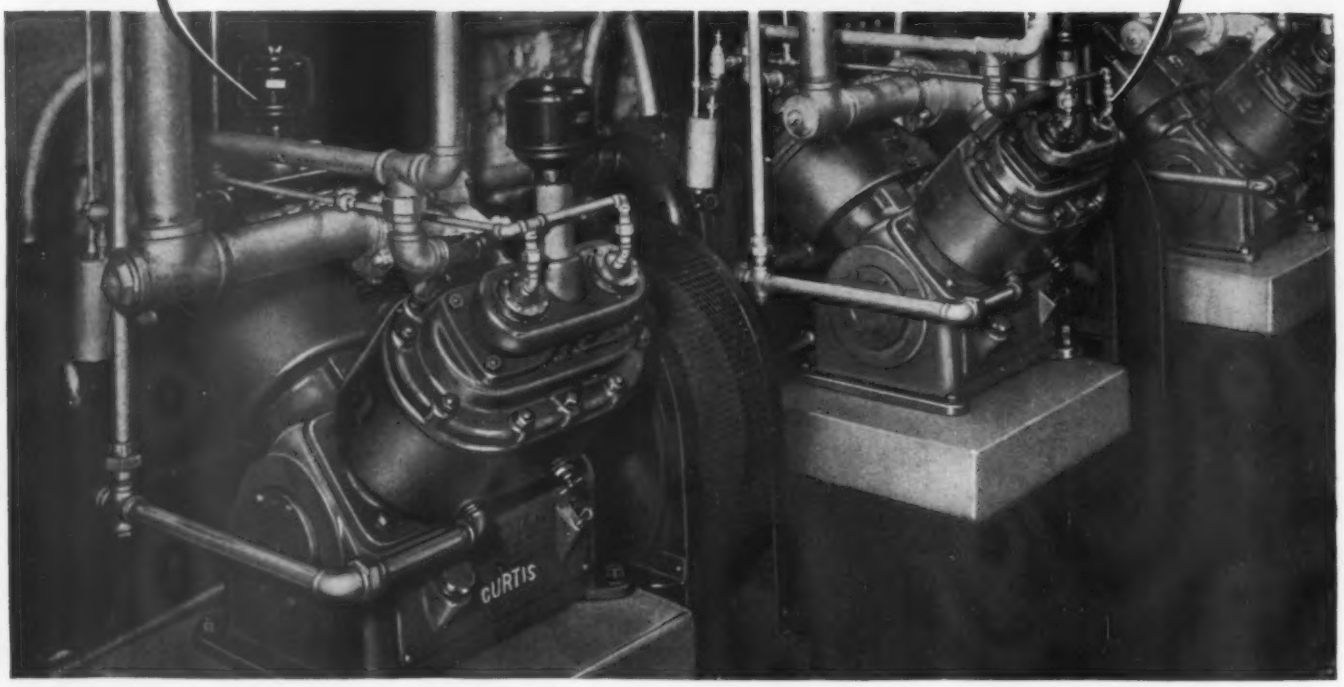

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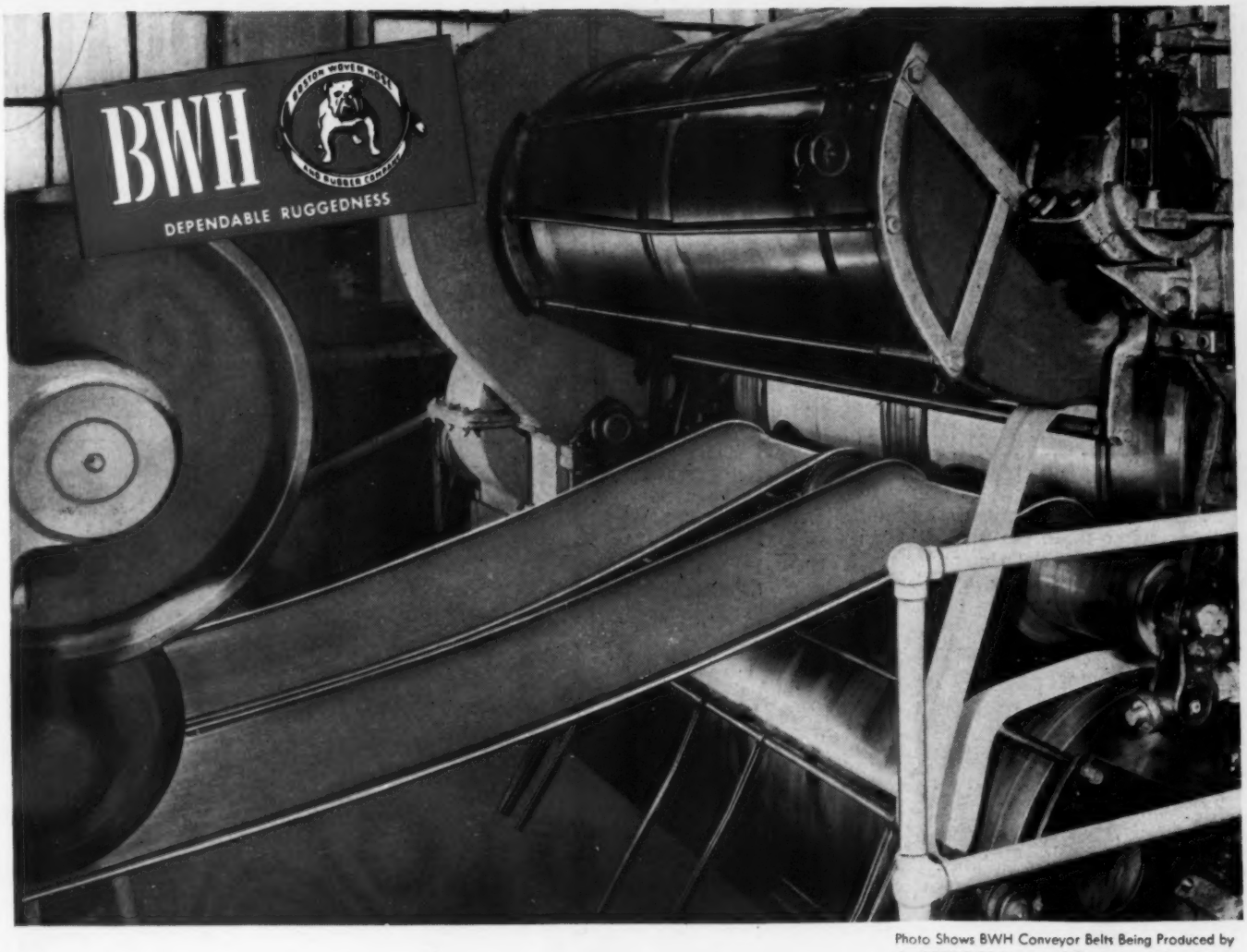

Photo Shows BWH Conveyor Belts Being Produced by the ROTOCURE Process of Continuous Vulcanization.

ONLY BWH BELTS

give you all the advantages of the ROTOCURE Process of Continuous Vulcanization

Industrial users have long recognized the potential faults in belts made by the old flat press process. By this method of vulcanizing, successive 30-foot segments of uncured belts are inserted in the flat press, stretched and vulcanized. Of necessity, the joints are overlapped in the press, resulting in overcuring. This may cause operational weakness in the belt.

15 years of tough, on-the-job testing has definitely proved that belts made by the famous ROTOCURE Process have many distinct advantages over flat-press cured belts, resulting in increased operating efficiency and lower maintenance costs.

Among these advantages are the following:

1. ROTOCURE eliminates press overlaps or overcured segments, through continuous vulcanization. Actual tests prove press overlaps may reduce flex-life as much as 40%.
2. ROTOCURE eliminates mechanical distortion, which occurs at the press ends in the flat-press method of curing.
3. ROTOCURE eliminates uneven stretch, because this process maintains constant, uniform stretch control throughout the curing of every inch of BWH Belts.
4. ROTOCURE eliminates from transmission belts, the dusting agents necessary in flat-press curing to keep belts from sticking to hot platens. Thus BWH Transmission Belts have a higher coefficient of friction, resulting in lowered operating tensions . . . prolonged belt life.
5. ROTOCURE eliminates non-uniform covers in conveyor and elevator belts, because this process never overcures any part of the belts. Thus the rubber covers of BWH Conveyor and Elevator Belts are uniformly abrasion-resistant.

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HOW PRODUCTION OF ROLLER CHAIN PINS JUMPED 300%

THE UNION CHAIN AND MANUFACTURING CO., Sandusky, Ohio, sprocket chain manufacturers, had difficulty keeping roller chain pin production in pace with the rest of the chain manufacturing operation. A bottle-neck lay in the end softening operation of the case hardened chain pins.

E. B. Pedersen, Airco Technical Representative, suggested oxy-acetylene flame softening, and with Union Chain engineers, devised an automatic flame softening unit. An Airco 9903 torch with specially designed extensions was used. A No. 2 tip, placed about 1½" away from the 5/16" diameter pin, softens the cottered end to a depth of 3/16". A No. 1 tip, somewhat closer, softens the other end to a depth of 1/16". A subsequent operation skins the head on the softened end of the case hardened pin.

With the exception of feeding pins into the chute, the unit is completely automatic, depth of softness is accurately controlled, and pin production has increased 300%.

Technical Sales Service—though not a packaged commodity—is as readily available to all industry as any Airco process or product. If you have a metal working problem, ask to have a Technical Sales Division man call. Address Dept. PR—7975, Air Reduction, 60 East 42nd St., New York 17, N. Y. In Texas: Magnolia Airco Gas Products Co., Houston 1, Texas. On West Coast: Air Reduction Pacific Company, San Francisco 4, Calif.

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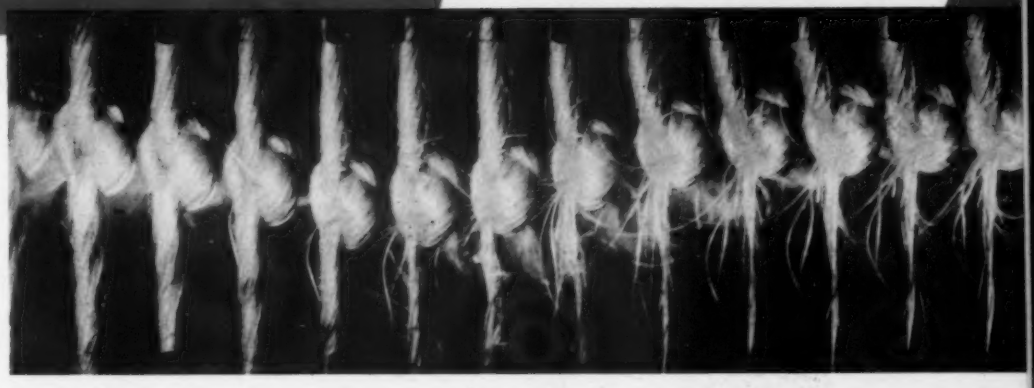
SPLICING vs. KNOTS

a PLYMOUTH Lifesaver

A splice is nearly twice as strong as the average knot. When you want to join two ropes—or rope ends to make a sling or loop—use the Short Splice. Take no chances on what a broken rope can do to put lives or property in danger! Plymouth has prepared this chart to make it easy for you to splice rope, for greater safety.



Taken by a high-speed camera, this series of photographs shows *why* a knot is *unsafe*. The rope breaks close to the knot because of the shearing action that a hard pull puts on the fibres there, cutting their resistance to tension.

The use of knots cuts the effective strength of rope—as much as 50%. Check that against the rope strength chart on the other side.

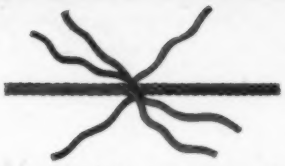
Plymouth Cordage Company
Plymouth, Massachusetts

TYPICAL KNOT EFFICIENCIES

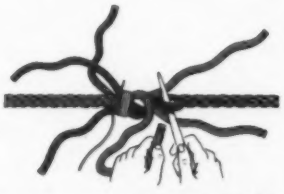
In this table, the efficiency of the knot is expressed in the percentage of hauling strength which that knot has, as compared with the actual tensile strength of the rope being knotted. Although typical, these figures will, of course, vary somewhat with the individual knot.

Bowline	50%
Bowline on Bight	60%
Square	50%
Weaver's	60%
Short Splice	95%
Long Splice	90%

How to make a SHORT SPLICE

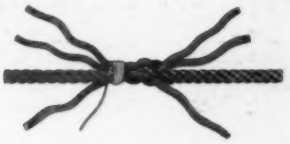


1. Unlay the strands of the ropes for a short distance, whip ends of the strands to prevent untwisting and put together as in diagram above, alternating the strands from each end.

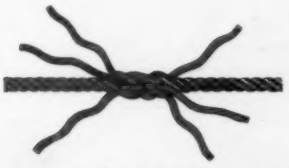


2. Now tie down one set of strands temporarily. Taking any strand of the opposite set, tuck it over and under one strand of the rope.

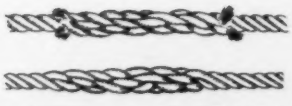
3. Tuck against the twist or "lay" of the rope. What happens is that the tuck goes over one strand, under the second, and out between the second and third.



4. Repeat the same operation with the other two strands from the same end of the rope.



5. Remove tie from other strands. Repeat operation on their side of rope. Continue two more tucks for each of the six strands.



6. To finish, roll and pound rope on hard surface. Don't cut ends of strands off too close! (See top sketch.)

For the tapered splice (see lower sketch) which gives better service, just take two more tucks with each strand, but before the first tuck, cut one-third the number of yarns from each strand. Then tuck. Now, cut strands again, removing one-half of the remaining yarns—and tuck again.

ROPE SIZES and STRENGTHS

NOTE: *These specifications are for three strand rope with standard lay. To figure safe loads use at least a 5 to 1 safety factor.*

NOMINAL SIZE			NET WGT. OF 100 FEET	MINIMUM LENGTH IN ONE POUND (NET WGT.)	APPROXIMATE GROSS WGT. FULL COILS	MINIMUM BREAKING STRENGTH	
THREADS	CIRCUMFERENCE	DIAMETER				PLYMOUTH SHIP BRAND MANILA	PLYMOUTH SISAL
	Inches	Inches	Pounds	Feet	Pounds	Pounds	Pounds
6-Fine	9/16	3/16	1.47	67.9	50	450	360
6	3/4	1/4	1.96	51.0	50	600	480
9	1	5/16	2.84	35.2	50	1,000	800
12	1 1/8	3/8	4.02	24.9	50	1,350	1,080
15	1 1/4	7/16	5.15	19.4	63	1,750	1,400
18	1 3/8	15/32	6.13	16.3	75	2,250	1,800
21	1 1/2	1/2	7.35	13.6	90	2,650	2,120
	1 3/4	9/16	10.2	9.80	125	3,450	2,760
	2	5/8	13.1	7.65	160	4,400	3,520
	2 1/4	3/4	16.3	6.12	200	5,400	4,320
	2 1/2	13/16	19.1	5.23	234	6,500	5,200
	2 3/4	7/8	22.0	4.54	270	7,700	6,160
	3	1	26.5	3.78	324	9,000	7,200
	3 1/4	1 1/16	30.7	3.26	375	10,500	8,400
	3 1/2	1 1/8	35.2	2.84	432	12,000	9,600
	3 3/4	1 1/4	40.8	2.45	502	13,500	10,800
	4	1 5/16	46.9	2.13	576	15,000	12,000
	4 1/2	1 1/2	58.8	1.70	720	18,500	14,800
	5	1 5/8	73.0	1.37	893	22,500	18,000
	5 1/2	1 3/4	87.7	1.14	1,073	26,500	21,200
	6	2	105.	.949	1,290	31,000	24,800
	6 1/2	2 1/8	123.	.816	1,503	36,000	28,800
	7	2 1/4	143.	.699	1,752	41,000	32,800
	7 1/2	2 1/2	163.	.612	2,004	46,500	37,200
	8	2 5/8	187.	.534	2,290	52,000	41,600
	8 1/2	2 7/8	211.	.474	2,580	58,000	46,400
	9	3	237.	.422	2,900	64,000	51,200
	9 1/2	3 1/8	264.	.379	3,225	71,000	56,800
	10	3 1/4	292.	.342	3,590	77,000	61,600
	11	3 1/2	360.	.278	4,400	91,000	72,800
	12	4	426.	.235	5,225	105,000	84,000

Standards: Smaller sizes of ropes are usually ordered by the number of threads, the larger sizes by circumference. 6, 9, and 12-thread rope is packed in standard 25 and 50 lb. coils. All larger sizes are put up in full coils of 200 fathoms—in half coils of 100 fathoms. One fathom equals six feet.

FREE! **Plymouth will gladly mail you upon request additional copies of this valuable chart for every department of your plant or shop where rope is used. Foremen and workers will find it useful in protecting life and property—saving rope—cutting costs!**

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MARCH, 1948

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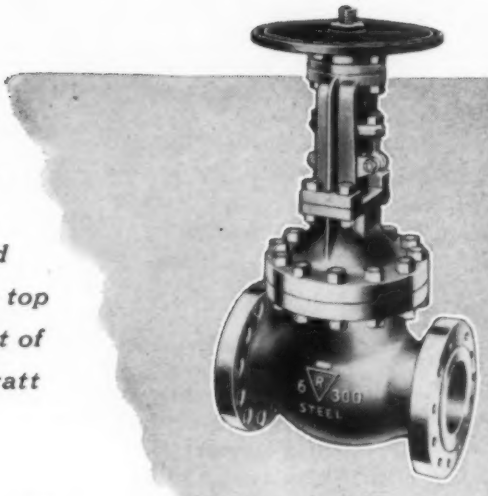
"VALVE MEN" LIKE R-P&C VALVES



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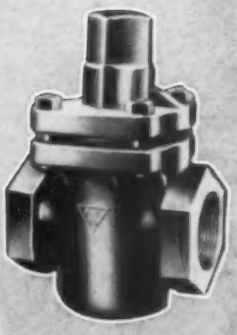

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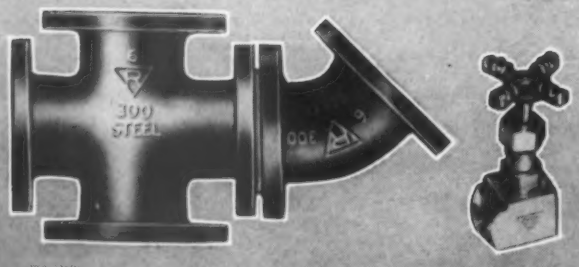

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IT COULD HAPPEN QUICKLY

THE SENSATIONAL break in grain prices during February may or may not be barometric in the sense of presaging the imminent development of a serious postwar depression. Most economic observers have discounted the interpretation that would extend its effects of that break to the industrial field. There are too many factors tending to sustain demand and prices for several months into the future, to render such a course probable.

It is barometric, however, as an indicator of the suddenness and severity with which the eventual decline may strike. The predictions of a gradual and orderly recession, or "controlled depression" have lost a great deal of their ringing confidence. The complacent attitude that "it can't happen here" has given way to the sober realization that it can happen here, and it can happen quickly. Sooner or later the imbalance between demand and supply, and between prices and income, will resolve itself by some other method than the tail-chasing process of continually higher costs and cost-of-living bonuses.

It is significant, also, in demonstrating that controls, whether voluntary or official, are not sufficient to keep somebody from getting hurt. That somebody is the one who fails to read the signs along the economic road, and fails to set his house in order for the change, whether it comes early or late, gradually or suddenly.

Purchasing agents are in a vulnerable position, between current shortages and high demand on the one hand, and the necessity of hedging stocks and commitments against a possible decline in values. Now the warning signal has been flashed. Prudent purchasing will not disregard that signal, but will proceed with caution until the road is clear.

Stuart F. Heinritz

Photographs show vast size of limestone mine operation. Shovels are 1½ yard, electrically powered; trucks are Diesels.

World's deepest

LIMESTONE MINE

TO AUGMENT raw materials supplies, Columbia mined 2,200 feet for limestone—almost beneath its plant at Barberton, Ohio.

The operation is notable in a number of other ways. Modern equipment of great size—capable of moving 300 tons of stone per hour—was assembled underground. The stone is screened and crushed; then brought to the surface by a semi-automatic hoist which attains a speed of 2,000 feet per minute and automatically brakes and dumps at the top.

This is another of numerous developments pioneered by Columbia for improved production and service to industry . . . Pittsburgh Plate Glass Company, Columbia Chemical Division, Pittsburgh 13, Pa. Manufacturers of Soda Ash, Caustic Soda, Liquid Chlorine, Sodium Bicarbonate and other alkalies and related essential industrial chemicals.

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HIGHLIGHTS

A brief summary of outstanding features of timely interest and importance in this issue, to conserve the time of busy readers

One of the most important recent changes in our Federal Government organization is the combination of Army, Navy and Air Forces in a single Department of National defense. One of the important corollaries to this development is **Unified Procurement** of military materials and supplies. This topic is discussed in two articles, by qualified purchasing officers of the Army and of the Navy, and reflecting the personal views of men who have had practical experience with the problems involved. General Wayne Allen (page 132) outlines the proposed procedure and controls, and Captain Charles Harter (page 135) discusses the need for basic specifications that can implement the plan.

New developments in **Tools and Machines** are being shown this month in the significant exhibit of the American Society of Tool Engineers at Cleveland. A preview of these exhibits is given on page 108. Purchasing agents must be alert to these developments, geared to today's need for increased production. The article will be supplemented by a report and further specific examples in next month's issue.

This month's **Guest Editorial** on page 91 describes the organization and activities of an outstanding State Purchasing Department. The efficiency and service of businesslike methods in governmental buying find conclusive evidence in the record of the author, George J. Cronin, who has been reappointed to the purchasing responsibility by five successive governors, and has served both Democratic and Republican administrations.

Bernard Baruch's proposal for a foreign relief program is woven around our own domestic problem of **Raw Materials.** No group in our whole business economy is more closely concerned, or more competent to judge the merits of the plan than are industrial purchasing agents. In the monthly survey of purchasing opinion (page 99) they generally approve the suggested program, see no great danger to domestic interests. But they are not unanimous in this view. Check your own views with those of other purchasing men in this summary.

Opportunities in Purchasing are intimately bound up with an active and practical program of education for better buying, says Clifton E. Mack in an article on page 101. Such educational facilities are available on a broad scale in the program sponsored by N.A.P.A. which is outlined in Mr. Mack's article, but active participation in that program is needed to make it effective.

For the past year, a monthly tabulation of **Product Delivery Information** has been featured in each issue. A review of the changes that have taken place over this period (page 113) reveals that industrial pipe lines are being filled and deliveries gradually approaching more normal time, though some important exceptions—particularly in steel supply—still plague the buyer. A more general view of the commodity and business situation, for the guidance of the purchasing man, appears in the insert section "Where We Stand" (page 125).

Control of purchasing policies and operations for an extensive **Branch Plant** organization is well exemplified in the purchasing department of Eaton Manufacturing Company, described on page 93 by Vincent Cada, who directs procurement for eleven manufacturing divisions of that company, representing fourteen different plants with varied requirements at scattered locations. A democratic system combining maximum independence of responsibility with the coordinating influence of a consistent policy, has proved highly effective in this department.

Quality of Product will always be a factor of primary importance in purchasing. The article on page 138 relates this factor to the functional responsibility of purchasing and quality control departments, defining the scope of each in arriving at the desired result. On page 141, Dewey H. Palmer discusses quality standards as they affect the purchase of hospital supplies.

The traditional shutdown for "Inventory Week" is now made definitely obsolete through the application of modern **Wire Recording** equipment that simplifies and speeds the process, and makes for greater accuracy in transcribing the record. Turn to the picture story on page 117 for a graphic demonstration of this modern method in action, with statistical evidence.

Are you making full use of these monthly departmental features compiled especially to keep you informed on recent industrial developments? A selected list of new **Trade Bulletins and Catalogs** that are yours for the asking (page 14) and the illustrated summary of **New Products & Ideas** now available for the industrial buyer (page 150) will help you to keep up-to-date on these matters.

"KEY PEOPLE"—*When You Need Steel*

Ryerson's function is not only to supply your steel, but to deliver it on time. From the moment the Ryerson switch-board flashes your incoming call until the steel is laid down in your plant, a corps of helpful, intelligent employees well-trained in the Ryerson "Immediate Steel" tradition are at your service.

The likeable young women at the switch-board, phone-order salesmen, dispatchers, crane operators, skilled warehousemen who cut, shear and shape stock sizes to fit your specification, truck drivers—all of them are key people at Ryerson—key people in your service, when you need steel!

In spite of shortages, we are putting forth every effort to serve all Industry to the best of our ability. Naturally, many sizes and certain products are out of stock. However, for the most part you can depend on Ryerson for immediate shipment of a wide range of steel products.

PRINCIPAL PRODUCTS

Bars—hot and Cold rolled	Mechanical Tubing	Tool Steel
alloy steel	Boiler Tubes and Fittings	Wire, Chain
reinforcing	Allegheny Stainless—	Bolts, Rivets
Structurals	sheets, plates, shapes,	Babbitt
Plates—	bars, tubing, etc.	Metal Working Tools
Inland 4-Way Floor Plate	Sheets and Strip Steel	& Machinery, etc.

JOSEPH T. RYERSON & SON, INC., Plants: New York, Boston, Philadelphia, Detroit, Cincinnati, Cleveland, Pittsburgh, Buffalo, Chicago, Milwaukee, St. Louis, Los Angeles

RYERSON STEEL

Service and Savings for the Taxpayer

● *By George J. Cronin*

THE Purchasing Department of the Commonwealth of Massachusetts is a Bureau in the Commission on Administration and Finance, which has four members—a Chairman, Budget Commissioner, Comptroller, and the State Purchasing Agent. The Budget Commissioner acts for the Governor in asking for appropriations from the legislature, the State Purchasing Agent spends the money after it is appropriated, and the Comptroller handles the details of accounting. The Chairman presides over meetings of the Commission, which is the staff agency for the Governor in the Executive Department. The Commission has been in existence since January, 1923.

The Purchasing Bureau buys for all departments and institutions of the Commonwealth. In addition to actual purchasing, the State Purchasing Agent has a laboratory which is used to test samples of material offered for sale to the Commonwealth and to test samples of deliveries that are made, to see that they comply with the specifications under which the purchase was made.

The State Purchasing Agent maintains a supply office which furnishes all stationery and other supplies to departments and institutions as required. He is also designated as the State Printer. In 1922, the year previous to the organization of the Commission on Administration and Finance, the cost of paper and printing to the Commonwealth was $806,714.35. By 1926, this cost had been brought down to $458,039.90. Last year, the State's printing bill amounted to $478,750.46. The State Purchasing Agent has authority under the law to refuse to act on requi-

George J. Cronin, Purchasing Agent for the Commonwealth of Massachusetts, has just been reappointed to that position for a seventh four-year term by Governor Robert F. Bradford. Mr. Cronin has been connected with the State Purchasing Department since it was first organized in January, 1923. He has been State Purchasing Agent since November, 1925, when he was appointed by Governor Alvan T. Fuller. He has been reappointed by Governors Ely, Curley, Saltonstall, and now by Governor Bradford. Although he is a Democrat in his personal political faith, his original appointment was by a Republican. Democratic and Republican governors alike have seen fit to reappoint him as his terms of office expired. There could be no more convincing evidence of his professional competence and personal integrity.

Mr. Cronin started his career in buying as an employee in the Navy Pay Office in Boston, in 1905. He continued in purchasing for the Navy until 1916, when he went to the Mexican border as a captain of infantry in a National Guard regiment. The following year he led his company to the battlefields of France, and returned as a major of infantry after nineteen months of active foreign service with the famous Yankee Division.

Postwar, he was employed by the Bethlehem Steel Company and the Gillette Safety Razor Company, then was called back into the governmental service as Superintendent of Supplies for the City of Boston, under appointment of Mayor Andrew J. Peters. In 1923, he went to work for the State, and it looks like a life-time job despite the occupational hazard of an appointive office in the public service.

He has been active and prominent in the affairs of purchasing organizations. He is a Past President and National Director of the New England Purchasing Agents Association, and was recently nominated to serve as Vice President of the National Association of Purchasing Agents for District No. 9 during the coming year. Currently he is serving as President of the National Association of State Purchasing Officials and as Chairman of the New England Association of Public Purchasing Officials.

In his spare time, he is President of the Commonwealth Cooperative Bank, and a trustee of the Milton Savings Bank. Mr. Cronin is married, and is the father of two grown daughters, both of whom are following professional careers as chemists.

sitions that are submitted to him, and if a department head has extravagant ideas so far as printing is concerned, changes are made or publication of the document is refused.

The amount of money spent by the State Purchasing Agent in the fiscal year ending June 30, 1947, was $13,983,641. Ten years ago, in 1937, expenditures were $8,614,074, but the Commonwealth has increased its services tremendously in those ten years.

The State Purchasing Agent buys for all the State institutions, and the food for 45,000 persons has to be contracted for and delivered so that these people can eat three times a day. We had last year in our institutions 36,762 inmates, and 8,292 employees working with the inmates.

The State owns and operates large farms. In fact, the State of Massachusetts has the largest herd of dairy cattle in New England. All of this requires that standardization be effected whenever possible, and consequently there are uniform specifications for foodstuffs, and for the animals' feeds. Brand names are eliminated in these specifications.

The State maintains the roads in the Commonwealth, has extensive park systems, beaches, and forests. There are four different police organizations, and all of these people must be clothed and fed.

The State Purchasing Agent is the official designated to deal with Federal agencies for the acquisition of surplus property items, and has been able to obtain from this source large quantities of material vitally needed by institutions and departments. He had a large part in acquiring from the Federal Government the use of buildings at Fort Devens for the University of Massachusetts, and he also had a lot to do with obtaining (without cost) Camp Myles Standish, complete with buildings, utilities and supplies, so that the State could start there another institution for the feeble-minded.

During the war, the State built up a State Guard organization. At the close of the war, the Guard was disbanded, and the material which had been bought for this purpose was distributed by the State Purchasing Agent to the various departments and institutions. An idea of what this meant may be gathered from the fact that 5,411 blouses, 3,795 trousers, 3,840 mackinaws, 2,296 campaign hats, and 3,840 ponchos were sent to institutions in the Commonwealth to help clothe the inmates.

Massachusetts works on the principle that when an item is purchased, that is not the end of the transaction or of the responsibility. Careful inspection is made, samples are taken and tested. In the case of coal, for example, the laboratories of the Purchasing Bureau, the Public Works Department, and even the Bureau of Mines in Washington, are asked to comment on samples. From every carload delivered to State institutions, a sample is sent to the laboratory. This is important because we burn 224,000 gross tons of coal every year, or its equivalent in oil. We use the facilities of the United States Department of Agriculture to assist in grading and inspecting meat, butter and eggs. The turkeys that are used at Thanksgiving and Christmas are all inspected by the Department of Agriculture. Last year, the laboratory of the Purchasing Bureau examined 2,347 samples, including coal, oil, and a wide variety of other purchased materials.

In addition to buying, the State Purchasing Agent acts as a sales agent for waste paper ,obsolete equipment, and anything that cannot be put to use in other departments or institutions. He has authority under the law to transfer material that is surplus in one department to another agency of the government that stands in need of the equipment or supplies. For example, there have been transfers of quantities of apples, potatoes, and other vegetables that were in large supply at one institution to the State Prison, which has no farm but needs foods of that character. The motors and other equipment made surplus in one plant are transferred to another agency where they can be put to use. The State maintains a Nautical Training School, and boats that were requisitioned for this school were found to be surplus in a Park Department; the transfer was made without cost to the taxpayers or to the institution. Radio equipment necessary for instruction purposes at the University of Massachusetts was transferred from the State Police, which had some such equipment that was not needed.

During the war, the State Purchasing Agent had authority from the United States Department of Agriculture to slaughter, and because of that he was able to collect for the State the sum of $157,815 on meat subsidy payments paid by the Federal Government on cattle, calves, and hogs. We bought live steers in Chicago, calves and lambs in Wisconsin, and then had them slaughtered.

The State Purchasing Agent buys all automobiles, and is responsible for the standardization of cars. For the past two years, the legislature has made an appropriation of $250,000 for the renewal of the State-owned motor fleet.

In line with the idea of inspection and watching the use of material purchased, the Purchasing Agent has attached to his Bureau a Power Plant Supervisor who makes regular inspections of the sixty-eight boiler plants operated by the Commonwealth. As the result of this inspection, we have full knowledge of the personnel operating the plants, and the equipment that is in the plants. This has been of great assistance in advising power plant engineers on proper methods of operation and maintenance. Through the work of the Power Plant Supervisor, the lubricating oil used in all power plants has been standardized, as is the lubricating oil used in the 1,900 State-owned automobiles.

Some of the specific agencies, other than institutions, for which the Purchasing Bureau buys, are: the Public Works Department, which maintains roads; the Metropolitan District Commission, which maintains parks and bathing beaches, and is also responsible for the water and sewer departments of the Boston metropolitan area; the Department of Conservation, which controls fish hatcheries and game farms, and has charge of the State forests. Also, the Bureau buys for two large airports, and furnishes supplies for the Port of Boston Authority, which controls the waterfront of the City of Boston.

Most governmental buying is done upon specific appropriations, but in Massachusetts somewhat greater flexibility is permitted. In addition to its regular appropriation, the Purchasing Bureau has a revolving fund of $500,000, which is used to make large purchases of materials in general use in the departments and institutions served, and is replenished by payments made by the using agencies. This revolving fund was used, for example, when the Commonwealth bought 221,464 pounds of coffee from the United States Department of Agriculture at a cost of 16.45 cents per pound. It was also used when we acquired large quantities of tea, jam, jelly, ice cream mix, raisins, pepper, egg powder, soap, shirts, rubber boots, shoes, blankets, insecticides, electric light bulbs, pillows, mattresses, stop watches, and fire extinguishers, all at very low prices. All these purchases have helped materially to reduce the cost of living for State institutions. When such material is acquired, it has to be bought in large quantities, and only through

(*Please turn to page* 315)

CENTRALIZED PURCHASING CONTROL FOR ELEVEN MANUFACTURING DIVISIONS

● ***By Vincent Cada***
Manager of Purchases
Eaton Manufacturing Company
Cleveland, Ohio

How a large parts manufacturer with fourteen scattered plants has combined the principles of on-the-spot buying authority and central control of policy and volume purchasing, to secure maximum efficiency and company benefit

Mr. Cada has been with the Eaton Manufacturing Company since 1917. He started in production work, transferred to the purchasing department in 1919.

IN 1932, Eaton Manufacturing Company inaugurated centralized purchasing at its general offices in Cleveland, for certain production materials and supplies used by its various divisions. The company was founded in 1911, and prior to 1932 its purchasing was organized on a decentralized basis.

The fourteen plants of the Corporation's eleven divisions in the United States and Canada are primarily producers of automotive parts for both truck and passenger cars. Other products are also made for the aviation, railroad appliance, and agricultural implement industries. Management felt that the economies inherent in quantity buying could best be realized through concentrating certain purchases in a central department. The reporting of current physical material inventories and the status of forward purchase commitments have also been centralized in Cleveland.

At the head of Central Purchasing is the Manager of Purchases, who reports directly to the President of the company. He is responsible for coordinating all the procurement activities of the corporation, for the development of sound procurement policies, and for their effective execution.

His staff consists of an Assistant Manager of Purchases, three additional buyers, and a Chief Clerk, each of whom has his own secretary and clerical staff. The Assistant Manager of Purchases is responsible for the placing of contracts for the company's requirements of such items as steel, pig iron, oils, and grinding wheels. He also coordinates the disposal of all scrap and obsolete or surplus inventory at the various divisions.

The three buyers handle all other major purchases, by classified commodities.

The Chief Clerk supervises the personnel of the Central Purchasing Department and is responsible for the department's day-to-day clerical operations, also for the collection and dissemination of statistical information on materials and purchases for the benefit of both general management and plant management. It is also his responsibility to furnish clerical assistance to the various Central Purchasing executives as needed.

In addition to this central staff, there are Plant Purchasing Agents located at each out-of-town plant, reporting to the Plant Manager. The responsibilities and authority of these men are essentially those of the Purchasing Agent of an independent corporation, but they operate within a consistent company policy originating at Central Purchasing, and their work is closely coordinated through the central office.

The Plant Purchasing Agent acquires production materials and supplies peculiar to the operation of the particular unit with which he is asso-

ciated. He also places orders and releases for such materials as may have been contracted for by Central Purchasing. He is usually responsible for following delivery on all material ordered for his plant. All maintenance of records and the usual clerical activities associated with them are under his direction. He approves all invoices before they are forwarded, through Central Purchasing, to Accounts Payable for final approval and payment. In addition, because of conditions applicable to a particular plant, he may have responsibility for production follow-up and inventory control.

Because he reports directly to the Plant Manager, the Plant Purchasing Agent is at all times cognizant of local conditions; because he customarily orders and releases against the division's sales orders, he is sales-minded; and because of his close connection with plant operations, he is production-minded as well.

All of the company's divisions are connected by direct wire with both the General Offices and the sales offices in Detroit. The Plant Purchasing Agent can therefore be in touch with either of these offices in a matter of minutes.

Basic Functions

The principal functions of Central Purchasing are:

(a) selection of sources and negotiating of contracts for basic commodities;

(b) collecting and disseminating to Plant Purchasing Agents, Plant Managers, and corporation executives, current information on general conditions and markets;

(c) coordinating and standardizing all corporate procurement procedures;

Directly behind the three-story office building is the 18.6-acre Axle Division; at the extreme right is the Stamping Division; the building between the two is used for rough castings storage, cafeteria, and salvage work.

(d) maintaining essential records, such as past purchases by commodities and by vendors; price changes; bids and quotations; inventories at all plants; present and potential commitments; and all other necessary information;

(e) investigation of new sources of supply as to their productive facilities, financial responsibility, and ability to meet production schedules;

(f) directing the disposal of salvage, obsolete and surplus inventory, and scrap;

(g) constant effort to eliminate unnecessary red tape in buying and to simplify the procurement system in the interest of speed, economy, and efficiency.

Buyers' Meetings

Because the policy of Central Purchasing has been to invest Plant Purchasing Agents with a maximum of authority and responsibility, and to confine itself wherever possible to functions of coordination and counsel, it has been found beneficial to have frequent meetings of the overall purchasing organization, including Plant Purchasing Agents and Central Purchasing executives. There is no set schedule for these meetings. Their frequency depends on the number and urgency of the problems that arise by reason of general conditions, or conditions within the industry, or within the organization; as a matter of general policy, they are held at least four times each year.

These meetings are held at the various plants, giving the entire purchasing staff an opportunity to get a broad view of the company's total operations and a first-hand familiarity with the conditions and operations at the individual plants. As the occasion permits, a portion of the meeting may be devoted to a complete resume of buying procedures and practices of the host plant, thus making the best ideas of each buyer avail-

General offices of the Centralized Purchasing Department at Cleveland headquarters

Brake drums are piled for inspection in the Receiving Inspection Department.

(Above) Valve Division at Battle Creek, Michigan. (At Right) Saginaw Division, where the Dynamatic Fans for Ford cars are produced. The fourteen Eaton plants comprise more than two million square feet of floor space for storage and manufacturing operations.

able to all.

The Plant Purchasing Agent at the location where the meeting is held usually conducts the meeting. The agenda is prepared by Central Purchasing, on the basis of items furnished by the Plant Purchasing Agents of all divisions. These programs run the whole gamut of procurement operations, ranging from a plant's experience with a particular supplier to general market conditions and inventory policies. Plant Purchasing Agents are urged to bring up at these meetings any and all questions they may have touching upon the company's procurement policies and methods. Items which may be of interest to all divisions are made the subject of a complete discussion, pro and con.

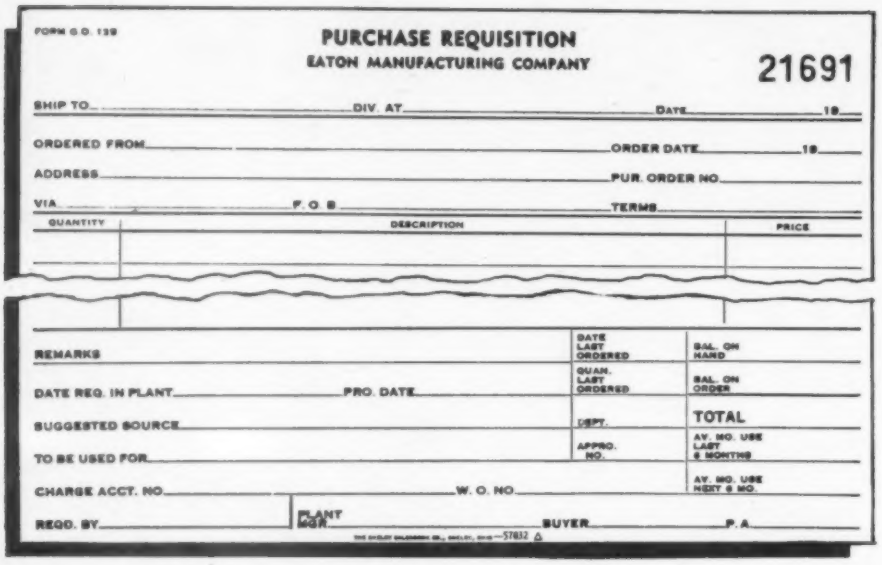
Minutes of the meetings are sent to all Plant Purchasing Agents, Plant Managers, Central Purchasing executives and corporate executives and officials. Copies of the minutes are filed for future reference, and Procedure Bulletins are issued by Central Purchasing, covering the important points.

All Plant Purchasing Agents participate in these discussions, and every man is encouraged to speak his mind freely and fully. The arguments sometimes become very spirited as opinions vary on the matters under consideration, but decisions reached by this conference method are usually concurred in by a majority present, and a Procedure Bulletin is issued soon afterwards to all concerned making the decision effective. In cases requiring further study, a committee is appointed to make a thorough research and to report back later with definite recommendations. These recommendations are then referred to the Plant Purchasing Agents by mail, and a Bulletin is issued when all responses have been collected.

Between meetings, any question which involves two or more plants is made the subject of a questionnaire. A form is sent to each Plant Purchasing Agent containing all the items which have any bearing on the particular problem. Time enough is allowed for each plant to give the matter full consideration and to gather all data pertinent to the subject. When the questionnaires have been completed and returned to Central Purchasing, a decision is made and the Procedure Bulletin is issued.

Receiving dock in the Axle Division.

Forgings and castings in rough storage, prior to machining



FORM G.O. 139

PURCHASE REQUISITION
EATON MANUFACTURING COMPANY

21691

SHIP TO ____ DIV. AT ____ DATE ____ 19__

ORDERED FROM ____ ORDER DATE ____ 19__

ADDRESS ____ PUR. ORDER NO. ____

VIA ____ F. O. B. ____ TERMS ____

QUANTITY	DESCRIPTION	PRICE

REMARKS

DATE LAST ORDERED | BAL. ON HAND

QUAN. LAST ORDERED | BAL. ON ORDER

DEPT. | TOTAL

APPRO. NO. | AV. MO. USE LAST 6 MONTHS

AV. MO. USE NEXT 6 MO.

DATE REQ. IN PLANT ____ PRO. DATE ____

SUGGESTED SOURCE ____

TO BE USED FOR ____

CHARGE ACCT. NO. ____ W. O. NO. ____

REQD. BY ____ PLANT MGR. ____ BUYER ____ P. A. ____

57832 Δ

Standard form of purchase requisition.

Obviously, different plants will have different problems, and if Central Purchasing attempted to decide every problem arbitrarily, and to direct every detail in fourteen scattered plants, it is likely that the results would be less satisfactory than under the democratic process outlined above, and the possible inefficiencies, delays, and confusions might be costly.

The value of these frequent conferences and the consequent free expression of opinions cannot be overemphasized. If two minds are better than one, certainly the experience and thinking of eleven minds concentrated on a purchasing problem are even better. Each Plant Purchasing Agent learns that his experience and knowledge are welcome contributions to the discussion. The company, therefore, obtains the maximum benefits of each plant's best thinking. Each man knows that he is a respected and vital member of the team, all working together toward a common goal. There is also the intangible but significant benefit obtained when men who must work together get better acquainted.

Eaton feels that the development of the Central Purchasing program has brought about several significant benefits in various fields of purchasing. One of the more obvious advantages is that of volume buying. By combining the requirements of all plants for basic materials and supplies, volume purchases through contract agreements are made possible, resulting in economies as to price, discounts, and other terms and conditions. Volume buying also makes feasible broader investigations resulting in wider and more exact knowledge of market conditions. Coordinated scheduling makes possible better control of inventories, and the allocation of large volume purchases to various suppliers puts the company in a more favorable position to secure advantageous deliveries in scarce markets. Likewise, it is easier to obtain compliance with material standards.

Some of the other important advantages may be summarized as follows:

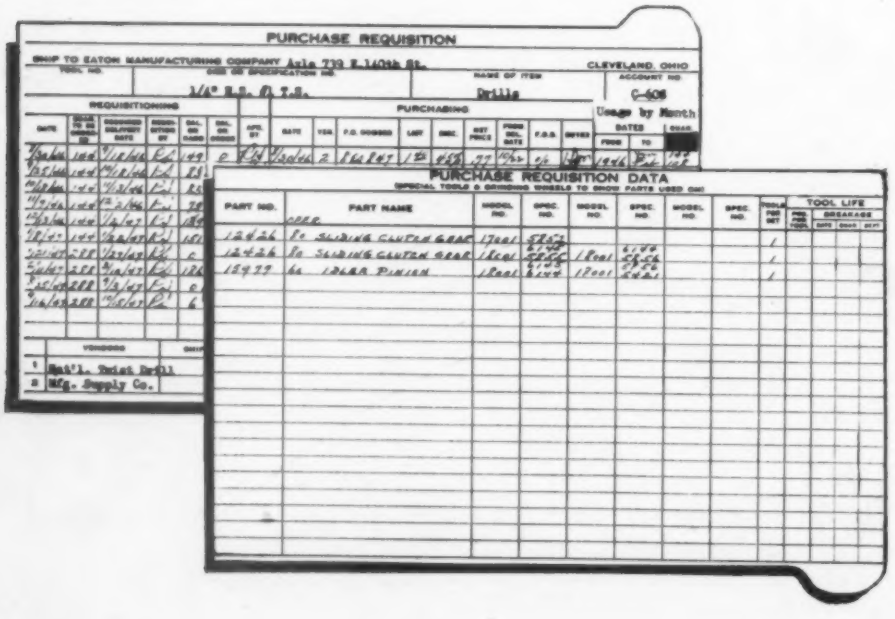
Stock Control. At every division except the Axle Division, which is the largest, with specialists in charge of each operation, the Plant Purchasing Agent has been made responsible for stock control, although he is not responsible for the taking of physical inventories, which are under the authority of the Controller. These stock control procedures in each division have been standardized, and generally speaking, all plants have taken advantage of the efficient procedures developed.

Scrap. Because scrap disposal is directed from a single authority, the company is able to obtain better prices and to dispose of it most advantageously.

Salvage, Surplus and Obsolete Supplies. Because of a large operation at scattered locations, inventory items in this category assume important aspects. With the close of hostilities, a check of supply inventories revealed that there was a tremendous stock of surplus items, many of which were not readily usable at the individual plant or in their present form. All of them offered either an opportunity of use in one or more of the other divisions, the possibility of salvage, or use in other forms, or their disposal as scrap was indicated, to be handled in a manner most advantageous to the company. It was decided to establish this function as a definite part of Central Purchasing procedure, and to set up a specific method for the handling of all such items, at all divisions, making this a permanent feature of stock control.

A committee was appointed to work out the necessary procedures. After the plan had been thoroughly

Specially designed stock record card for recurring items, that serves the additional purpose of a "traveling requisition".



discussed and the methods of operation approved, a Procedure Bulletin on the subject was issued to each Plant Purchasing Agent.

A catalog of all surplus, salvagable, and obsolete items was compiled and supplied to each plant. This catalog was classified as to commodities, showing the location and quantity of each item, its condition and value. Values were set both for inter-company transfers and for outside purchasers.

After the inauguration of this procedure, inventories at each division were scanned every ninety days for additions to the catalog or eliminations from it by reason of sale or other disposal. Each plant was notified of these changes, and was charged with the responsibility of entering the changes in their copy of the catalog. Items which had not moved within a given period were declared surplus by Central Purchasing and disposed of in the scrap program.

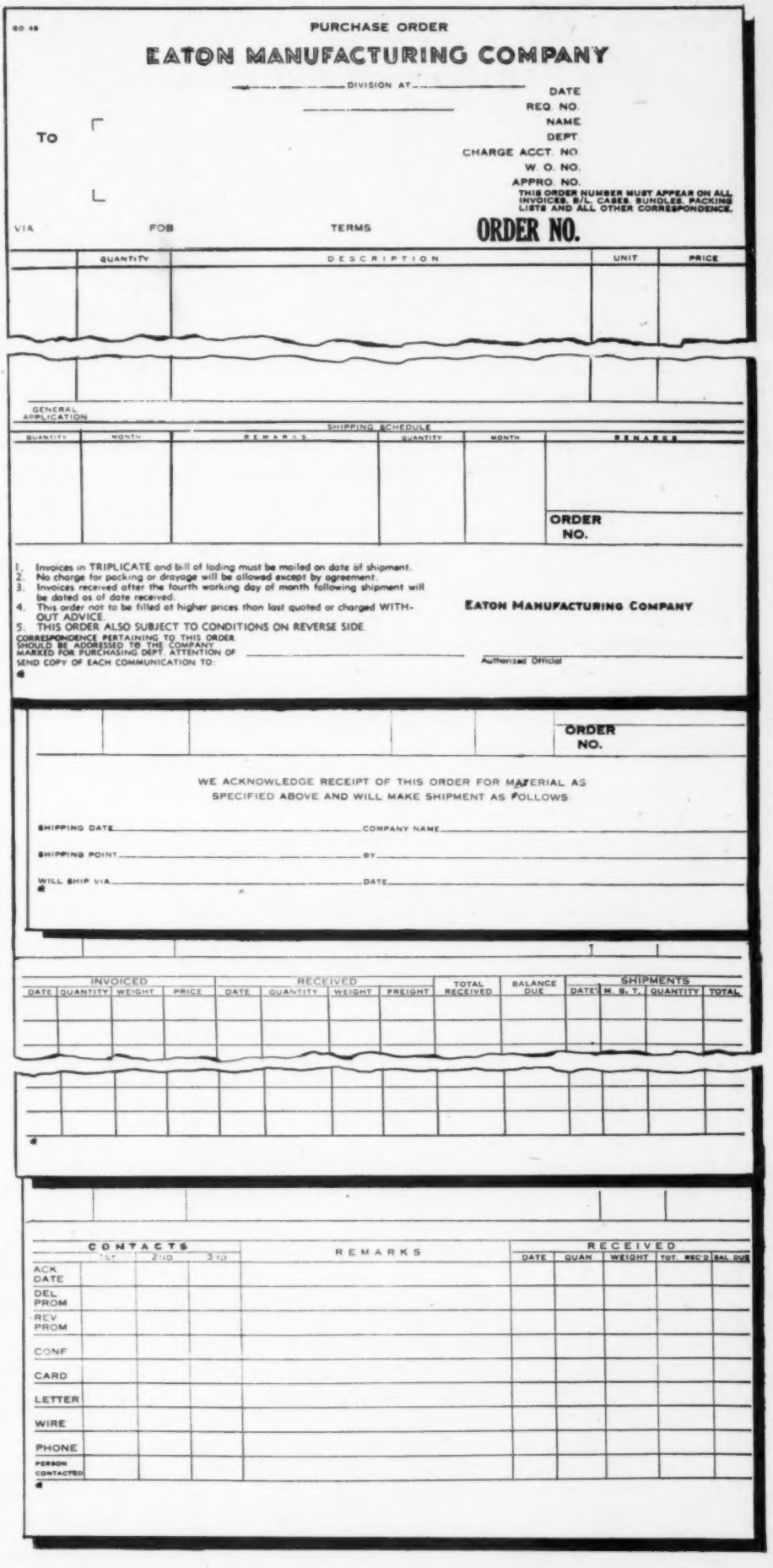
The master catalog is maintained in Central Purchasing. This plan has now become established routine and has proved very helpful in keeping plant inventories at a minimum and free of "dead" items.

Advantage to Vendors. Centralized purchasing is also a distinct advantage to vendors in that they can get all the necessary information regarding requirements of all plants at the central office.

Standardized Forms. With minor exceptions made necessary by local conditions, each plant uses the same form of purchase requisition, purchase order, acknowledgement, follow-up, and receiving report. These forms, of course, carry a separate series of numbers for each plant, and a prefix letter indicates the plant at which they originate.

The Purchase Requisition originates in the Plant Production Department for production items, and in the Maintenance, Supply Stores, Tool Design, or Plant Engineering Departments for supply items. It represents a request by the head of one these departments for the Purchasing Department to obtain needed material. Requisitions for major supplies are subject to the approval of the Plant Manager. In addition to describing the item required, the requisition indicates the normal quantity used, the date it is needed in the plant, and the department to which delivery is to be made.

At the larger plants we have developed what is known as a "Traveling Requisition". This is simply a


PURCHASE ORDER

EATON MANUFACTURING COMPANY

DIVISION AT _____ DATE

REQ. NO.

NAME

DEPT.

CHARGE ACCT. NO.

W. O. NO.

APPRO. NO.

THIS ORDER NUMBER MUST APPEAR ON ALL INVOICES, B/L, CASES, BUNDLES, PACKING LISTS AND ALL OTHER CORRESPONDENCE.

TO

VIA FOB TERMS

ORDER NO.

QUANTITY	DESCRIPTION	UNIT	PRICE

GENERAL APPLICATION

SHIPPING SCHEDULE

QUANTITY	MONTH	REMARKS	QUANTITY	MONTH	REMARKS

ORDER NO.

1. Invoices in TRIPLICATE and bill of lading must be mailed on date of shipment.
2. No charge for packing or drayage will be allowed except by agreement.
3. Invoices received after the fourth working day of month following shipment will be dated as of date received.
4. This order not to be filled at higher prices than last quoted or charged WITHOUT ADVICE.
5. THIS ORDER ALSO SUBJECT TO CONDITIONS ON REVERSE SIDE.

CORRESPONDENCE PERTAINING TO THIS ORDER SHOULD BE ADDRESSED TO THE COMPANY MARKED FOR PURCHASING DEPT. ATTENTION OF

SEND COPY OF EACH COMMUNICATION TO:

EATON MANUFACTURING COMPANY

Authorized Official

ORDER NO.

WE ACKNOWLEDGE RECEIPT OF THIS ORDER FOR MATERIAL AS SPECIFIED ABOVE AND WILL MAKE SHIPMENT AS FOLLOWS

SHIPPING DATE _____ COMPANY NAME _____

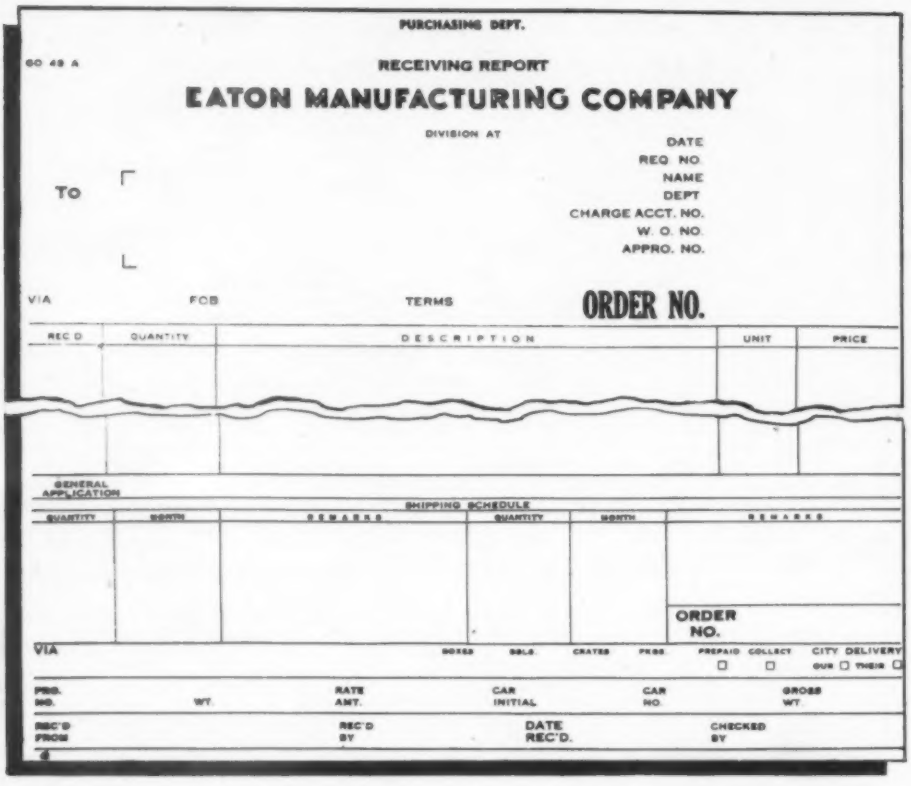
SHIPPING POINT _____ BY _____

WILL SHIP VIA _____ DATE _____

INVOICED				RECEIVED				TOTAL RECEIVED	BALANCE DUE	SHIPMENTS			
DATE	QUANTITY	WEIGHT	PRICE	DATE	QUANTITY	WEIGHT	FREIGHT			DATE	M. B. T.	QUANTITY	TOTAL

CONTACTS 1ST	2ND	3RD	REMARKS	RECEIVED DATE	QUAN	WEIGHT	TOT. REC'D	BAL. DUE
ACK. DATE								
DEL. PROM								
REV. PROM								
CONF								
CARD								
LETTER								
WIRE								
PHONE								
PERSON CONTACTED								

Purchase order, showing work spaces for recording acknowledgment, receiving and follow-up information.



PURCHASING DEPT.

60 49 A

RECEIVING REPORT

EATON MANUFACTURING COMPANY

DIVISION AT

DATE
REQ. NO.
NAME
DEPT
CHARGE ACCT. NO.
W. O. NO.
APPRO. NO.

TO

VIA FOB TERMS **ORDER NO.**

REC'D	QUANTITY	DESCRIPTION	UNIT	PRICE

GENERAL APPLICATION

SHIPPING SCHEDULE

QUANTITY	MONTH	REMARKS	QUANTITY	MONTH	REMARKS

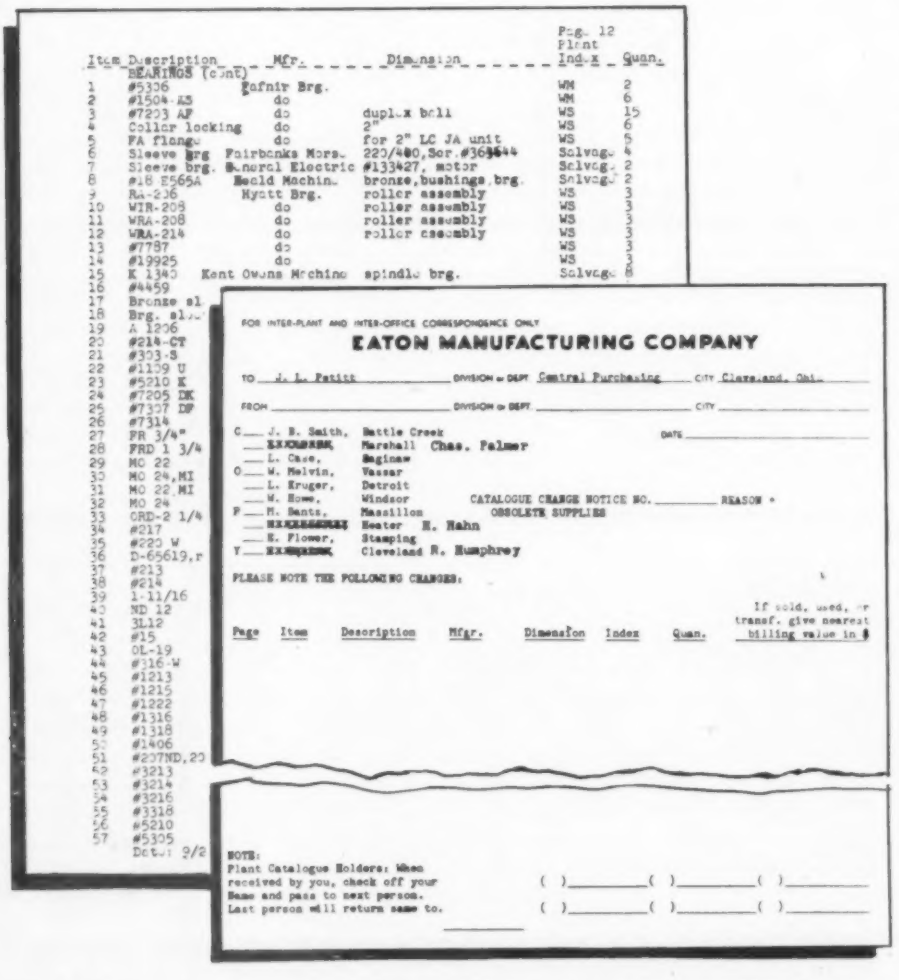
ORDER NO.

VIA BOXES BDLS. CRATES PKGS. PREPAID ☐ COLLECT ☐ CITY DELIVERY OUR ☐ THEIR ☐

PKG. NO. WT. RATE AMT. CAR INITIAL CAR NO. GROSS WT.

REC'D FROM REC'D BY DATE REC'D. CHECKED BY

Receiving report, made out in triplicate.



Item	Description	Mfr.	Dimension	Page 12 Plant Index	Quan.
	BEARINGS (cont)				
1	#5306	Tafnir Brg.		WM	2
2	#1504-A3	do		WM	6
3	#7203 AF	do	duplex ball	WS	15
4	Collar locking	do	2"	WS	6
5	FA flange	do	for 2" LC JA unit	WS	5
6	Sleeve brg	Fairbanks Morse.	220/440,Ser.#369644	Salvage	4
7	Sleeve brg.	General Electric	#133427, motor	Salvag.	2
8	#18 E565A	Meald Machin.	bronze,bushings,brg.	Salvage	2
9	RA-236	Hyatt Brg.	roller assembly	WS	3
10	WIR-208	do	roller assembly	WS	3
11	WRA-208	do	roller assembly	WS	3
12	WRA-214	do	roller assembly	WS	3
13	#7787	do		WS	3
14	#19925	do		WS	3
15	K 1340	Kent Owens Machine	spindle brg.	Salvage	8
16	#4459				
17	Bronze sl				
18	Brg. sl				
19	A 1206				
20	#214-CT				
21	#303-S				
22	#1159 U				
23	#5210 K				
24	#7205 DK				
25	#7307 DF				
26	#7314				
27	FR 3/4"				
28	FRD 1 3/4				
29	MO 22				
30	MO 24,MI				
31	MO 22,MI				
32	MO 24				
33	ORD-2 1/4				
34	#217				
35	#220 W				
36	D-65619,R				
37	#213				
38	#214				
39	1-11/16				
40	ND 12				
41	3L12				
42	#15				
43	OL-19				
44	#316-W				
45	#1213				
46	#1215				
47	#1222				
48	#1316				
49	#1318				
50	#1406				
51	#207ND,20				
52	#3213				
53	#3214				
54	#3216				
55	#3318				
56	#5210				
57	#5305				
	Detail 9/2				

FOR INTER-PLANT AND INTER-OFFICE CORRESPONDENCE ONLY

EATON MANUFACTURING COMPANY

TO J. L. Pettit DIVISION or DEPT. Central Purchasing CITY Cleve.and, Ohi.

FROM DIVISION or DEPT. CITY

C ___ J. B. Smith, Battle Creek DATE
___ [redacted], Marshall Chas. Palmer
___ L. Case, Saginaw
O ___ W. Melvin, Vassar
___ L. Kruger, Detroit
___ W. Howe, Windsor CATALOGUE CHANGE NOTICE NO. ____ REASON *
F ___ M. Bantz, Massillon OBSOLETE SUPPLIES
___ [redacted] Heater H. Hahn
___ E. Flower, Stamping
Y ___ [redacted], Cleveland R. Humphrey

PLEASE NOTE THE FOLLOWING CHANGES:

Page	Item	Description	Mfgr.	Dimension	Index	Quan.	If sold, used, or transf. give nearest billing value in $

NOTE:
Plant Catalogue Holders: When received by you, check off your name and pass to next person. Last person will return same to.

( )_____( )_____( )_____
( )_____( )_____( )_____

Specimen page of surplus supplies catalog, and the form on which changes are reported for catalog revisions.

specially designed stock record card covering items that are constantly reordered. This card contains all information regarding current usage, models and part numbers on which the material is used, and standard quantities in which it is to be restored. When a reorder is necessary, the card is forwarded to the Plant Purchasing Agent and is made the basis of a Purchase Order. These requisitions are reviewed regularly and serve as a notification of any change in design or of the obsolescence of products which would naturally affect the requirements of the item. The Purchasing Order number is entered on the Traveling Requisition, which is then returned to the Stores Control Department, thus eliminating the preparation of individual requisitions and saving a great deal of clerical time and effort.

The Purchase Order is prepared in nine copies. In addition to the vendor's copy and acknowledgement, there are copies for Plant Purchasing, Central Purchasing, Follow-Up, Stores, Receiving, and Cost Departments. Purchasing and Stores copies have a space for recording receipts, invoices, and balance due on the order. The Follow-Up copy, also has a special block for indicating rate and nature of first, second, and third follow-up action, and for noting the vendor's response.

In cases where an entire order is received in a single shipment, the Purchase Order copy is used as the Receiving Report. Where two or more shipments are made against the same order, a special form of Receiving Report similar to the Purchase Order is used. A suffix letter is added to the order number—A, B, C, etc.—to indicate successive receipts against the order.

Executive Commendation

In concluding this description of Central Purchasing control of a decentralized manufacturing operation, with considerable delegation of authority to Plant Purchasing Agents and inviting them to contribute to the formulation of procurement policies, it may be well to quote our President, Mr. C. I. Ochs, who recently observed:

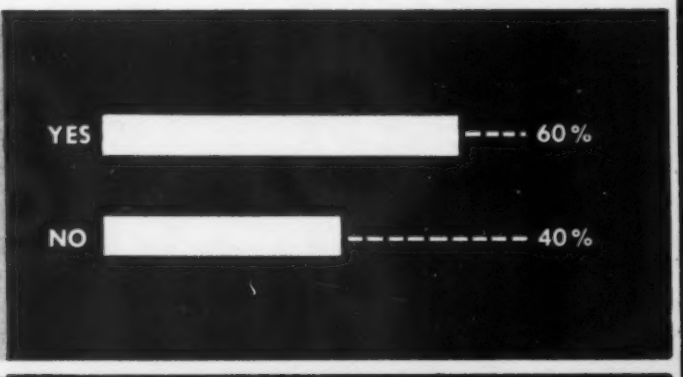
"We feel that our purchasing organization has obtained the maximum benefits of centralization without destroying the flexibility of action so desirable in procurement functions. We have also retained the valuable personal initiative of our plant organization by avoiding endless red tape.

PURCHASING OPINION

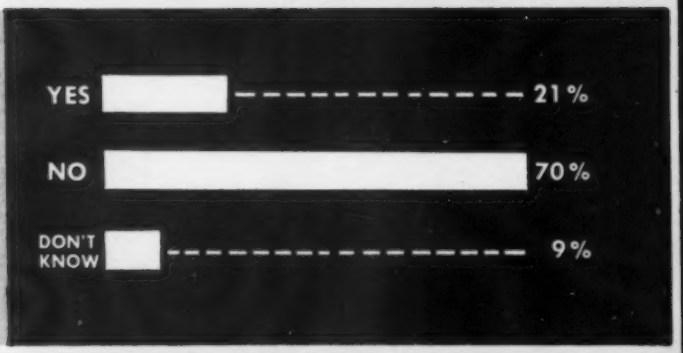
Can We Afford to Buy The WORLD'S RAW MATERIALS?

Bernard Baruch's provocative proposal to the Senate Foreign Relations Committee that "the United States stand ready to buy all non-perishable raw materials produced anywhere and by anyone in the world for the next five years, and which cannot find normal markets" puts the nation's purchasing agents squarely in the middle. Because they are in the best position to judge the effects of such a program on the domestic economy, PURCHASING has polled a cross section of purchasing executives in all parts of the country for their opinions on the more important aspects of the plan. The results follow:

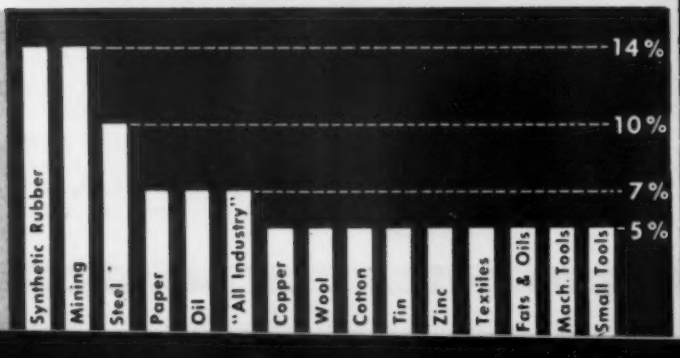
1 Do you think that the plan for foreign purchases would directly benefit your company or industry through greater availability of raw materials?



2 In your opinion, are there any industries that would be seriously harmed by a large flow of basic raw materials into this country?



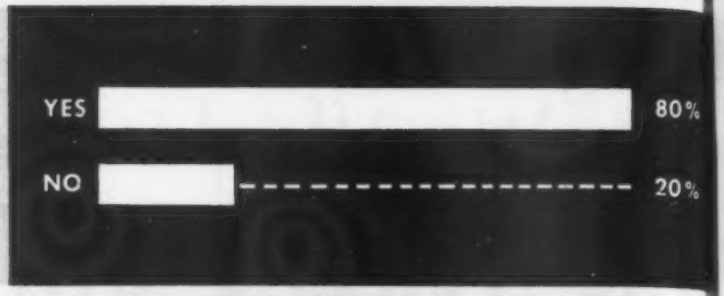
3 If the answer to Question 2 is "Yes", specify industries that would be adversely affected.



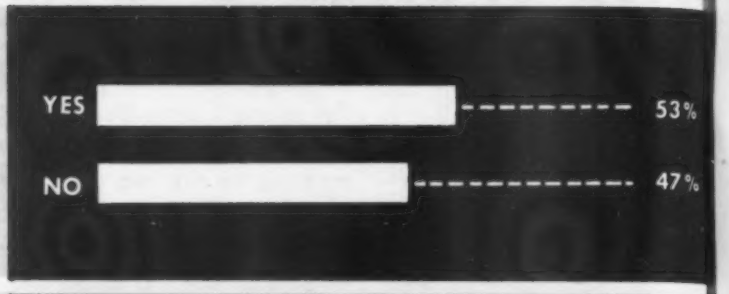
Note: Some respondents named more than one choice on this question so percentage factors total more than 100.

would result in lower prices on raw materials here, eventually reflected in lower prices for finished goods, or that the money outlay necessary to sustain the program would cause further inflation in this country ?

5 Assuming that purchases of foreign raw materials would result in certain surpluses here, do you agree with Mr. Baruch that they could be "safely stored against our future needs and against the depletion of our own natural resources" ?



6 Do you believe that such a program will "greatly and quickly reduce Europe's financial needs" ?

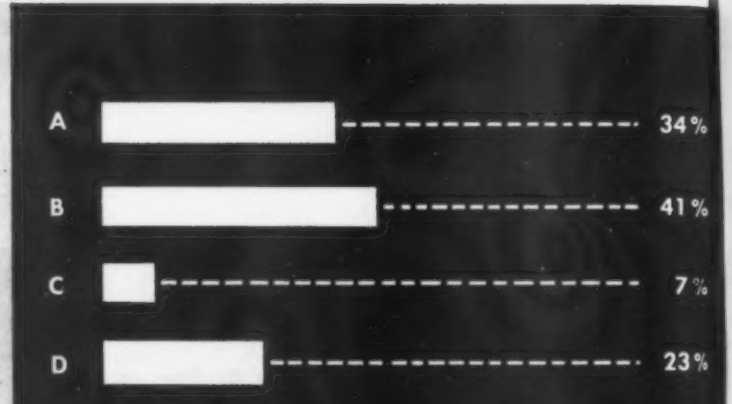


7 If you feel that the plan has merit, how could it be best incorporated into the general program for European Recovery:

a. As a minor part of ERP
b. As a major part of ERP
c. As the only method of help, discarding ERP altogether
d. Limited to government stockpiling of raw materials

?

Note: Some respondents named more than one choice on this question so percentage factors total more than 100.



WHAT THEY SAY

"Europe needs to export manufactured goods more than raw materials . . . plan would not aid much."

"I chose 'd' in Question 7 because it would be a measure of prohibiting business from 'holding out' on scarce items later on, thereby jacking up prices to the public. The plan as a whole would merit strict governmental control."

"Barney took the words right out of my mouth!"

"Baruch's proposal is preposterous!"

"The materials we would get would be non-essential and what no one else wanted."

"Believe the plan would help supply catch up with demand, unless they used our money for wild buying in Russia and similar rat-holes."

"No matter what scheme is advanced, someone is not going to like it. I am for it."

"To much of a 'blank check'. Would put the whole world on WPA basis with USA paying the bills."

"We feel cold on the subject."

"Europe is made up of intelligent people, and intelligent people can be happy only if there is pride in their accomplishment. Let them produce what we want and are short of, and let's pay money for what we get."

"Stockpiling of materials would be misused by politicians and sold at great loss as 'surplus' with benefit to administration employes only."

"The plan is an improvement on the Marshall Plan. However, it would call for further government expansion and we have too much now."

"Direct relief leads to laziness and dependency. Foreign purchases would increase employment and automatically start recovery program."

OPPORTUNITIES IN PURCHASING

● ***By Clifton E. Mack***
Director, Federal Bureau of Supply
Washington

Opportunity beckons the man who prepares himself to do a better and a bigger job by taking advantage of the educational opportunities now available to help him

Address at the meeting of the Baltimore Association of Purchasing Agents, January 21, 1948.

VERY recently, this Scientific Age was candidly summed up in a letter from an enterprising boy in New Jersey addressed to the United States Government. He wanted a list of all the things that haven't been invented yet. He said he was anxious to get started, and didn't want to cover anybody else's ground.

As sublime as that is, contrast it with the report which the Commissioner of Patents filed, about a hundred years ago, with Congress. He said then that the miracles of human inventiveness had apparently reached the point where all further progress must stop.

Somewhere between those two attitudes—one of resignation to a static existence and the other a youthful determination to immediately solve all scientific objectives—is the ideal outlook which Americans everywhere are expressing today. We must progress in scientific development as rapidly as possible and as consistent with the ability of our civilization to accept it.

The average person of today has seen such progress—political, scientific, economic—that when he stops to appraise his own personal situation, many things which are now commonplace in his daily life were either completely unknown or laboratory curiosities a decade ago. Even the 1948 issue of the conservative Old Farmer's Almanac, published by Yankee, Inc., at Dublin, N. H., refers in the editor's preface to the "156th continuous edition, published in the Atomic Year 3."

All of us clearly remember the beginnings of commercial radio. All of us can probably mark a time when we had never even heard the word "television." The colorful existence of plastics, life-saving drugs, mammoth public works on a scale never before comprehended, of terrible weapons and wonderful machines—these are modern in the truest sense of the word.

The impact of these developments is profoundly affecting our thinking. We are becoming a world of specialists, which in turn is increasing our capacity to do a better job; to prepare ourselves for greater responsibilities. So long as that condition exists we should be able to diminish our national problems and, if the day should come when a similar ideology of progress crosses all boundaries, our international problems will have a common meeting ground for solution.

Need for Education

Education today is everybody's business. It is necessarily so because of the rapid accomplishments of science and the need for our civilization to keep pace with them. The advancements almost daily of improved methods for production, new uses for materials, improved transportation and communications facilities, the processing and handling of foodstuffs, also new means of combating disease—all of which affect us in the conduct of our business—likewise emphasize the need for our development as individuals in a changing society.

This has long been a rather obvious conclusion; yet only during the most recent periods has the individual taken cognizance of it—and acted accordingly. The modern employed person has more leisure time now, on the average, than at any other phase of our industrial history. Work weeks are shorter; modern techniques have conserved human energies so that much is left for leisure time. The outlets for leisure have multiplied.

Those who are alert to all these things, but nevertheless realize the possibilities of devoting a part of

Clifton E. Mack (right) receiving the government's Medal of Merit for distinguished civilian service in wartime procurement, December 23, 1947. The presentation was made by E. H. Foley, Jr., Assistant Secretary of the Treasury.

their spare time to developing their capacities for increased earning power and they are finding it to be very profitable.

The GI Bill of Rights, evening courses, industrial programs and correspondence schools are serving millions of Americans intent upon self-betterment, which is abundant evidence that adult education in this country is now under way on an unprecedented scale. The significant recognition of the value of this endeavor to industry is being recognized more and more. An unusually good example is the current program of the General Electric Company.

Recently, General Electric has announced with rightful pride that some 12,000 employees are studying subjects ranging all the way from accounting to theoretical mathematics—alert, enterprising employees desiring to acquaint themselves more fully with the ramifications of the company's program and their own jobs. It may at first be said by a few depreciating souls that, since the Company pays for it, the employee has nothing to lose. Of course, even though the Company bears the expense, the employee spends much of his own, otherwise leisure, time in study at home. It is an indication of the willingness of people to learn. Add to the 12,000 GE people the many hundreds of thousands elsewhere, and the magnitude of the effort being put forth to remain progressive becomes apparent. Progress may be irregular but it is constant. Keeping abreast of the times is more than a cultural improvement. It has become an absolute necessity.

The requirement for those in the purchasing world, government and industrial, is equally acute. Fortunately, the means to do so are available in abundance.

Education for Purchasing

One of these—a major one—is the current educational program of the National Association of Purchasing Agents. The NAPA's National Education Committee is dedicated to bring about efficient and continuous progress on all educational matters affecting the profession of purchasing, both industrial and public. I am afraid that some of us do not fully realize or appreciate the possibilities. Let's review the NAPA Educational Program and decide how we can best use the material.

At the helm is a Policy Committee, with George Aljian, National President of NAPA last year, as the capable and enthusiastic chairman. Members include B. B. Countryman of the Minnesota Mining and Manufacturing Company; V. de P. Goubeau of RCA, and Ben R. Newbery of the Lone Star Gas Company; also a former National President of the NAPA.

This Policy Committee determines projects to be pursued and the procedure to be followed. There are also six major Development Committees working with the Policy Committee, each responsible for one particular phase of further education in purchasing. These are the Committees on Purchasing Literature; on Education in Local Associations; Schools and Colleges; "How-to-Buy"; Visual Education; and the development of Intra-Company Activities.

In addition to the Committees, nine District Chairmen of the NAPA act as liaison between the entire Committee on Education and local associations of the NAPA. The educational structure is finally rounded out by a staff of consultants, including such men as Stuart Heinritz, Editor of PURCHASING Magazine; Professor Howard T. Lewis of Harvard Business School, and several others. The Consultants recommend projects which the Committee should pursue.

Company Training Programs

Illustrative of the current program, you may be interested in the Development Committee on Intra-Company Activities. Stanley W. MacKenzie of the U. S. Rubber Company is Chairman. R. L. Van Cleve of Carnegie Illinois Steel and I are members of the Committee.

Our purpose is to suggest ways and means to industrial companies which they may find useful in the development of a more efficient purchasing department through programmed training. It is a unique task, particularly in companies not having any training program, since adult education has certain characteristics apart from other forms. For example, a man who has performed one particular job faithfully and well for a number of years may be of the opinion that he is well qualified by reason of his experience but he is overlooking the fact that today it is not enough to know your own job — you must know how others are doing simliar jobs—how the job ties in with related operations—new ideas and new methods. That is the progressive approach.

At the present time, the Committee is working on a course of training which can eventually be sent to companies having purchasing organizations. This will show, step by step, the modern educational practices which might be employed by a Company in training its purchasing people. It will stress the practical things, giving suggested subject matter for discussion with sufficient latitude to meet individual needs.

Other Phases of Program

Another very important Development Committee is that called the committee on "How To Buy". It develops basic written material on just that — how to buy — and suggests outlines for "How To Buy" courses for possible use in schools, local associations and in companies. This idea was initiated by Ed Scully and, at the present time, Chairman Pete Wight of the Bausch & Lomb Optical company and his Committee are at work assembling new material to fully develop the subject for training purposes.

The Committee on Visual Education to develop purchasing information through movies and industrial films has a very interesting program. We have used films at the Bureau of Federal Supply for training purposes, also to keep the organization informed on new developments in production and distribution of commodities also their uses, and we find that it is very effective. The other Development Committees of the National Association of Purchasing Agents are similarly interesting and vitally essential to a well balanced program.

The point I want to emphasize is while this program for education is being developed, its effective use depends, first, upon the local associations planning an educational program and, secondly, on the participation of each member in the local educational programs. I feel that this program is one of the greatest benefits to be obtained from NAPA membership. It is a program which will be carefully prepared and comprehensive, and its value to the individual is incalculable.

We cannot measure an educational program in terms of benefits to the individual alone. There is a far greater significance in the development of purchasing as a practical science, so that all will benefit as well as ourselves. Only in that way can we obtain the full measure of the potentialities of an educational program for purchasing.

I would like to touch on another educational opportunity for those who are interested in public purchasing. Last year, W. Z. Betts, Director of Purchase and Contract for North Carolina and now President of the National Institute of Governmen-

tal Purchasing, suggested that the Bureau of Federal Supply organize a National Academy of Public Purchasing. I will briefly review the considerations and subsequent developments.

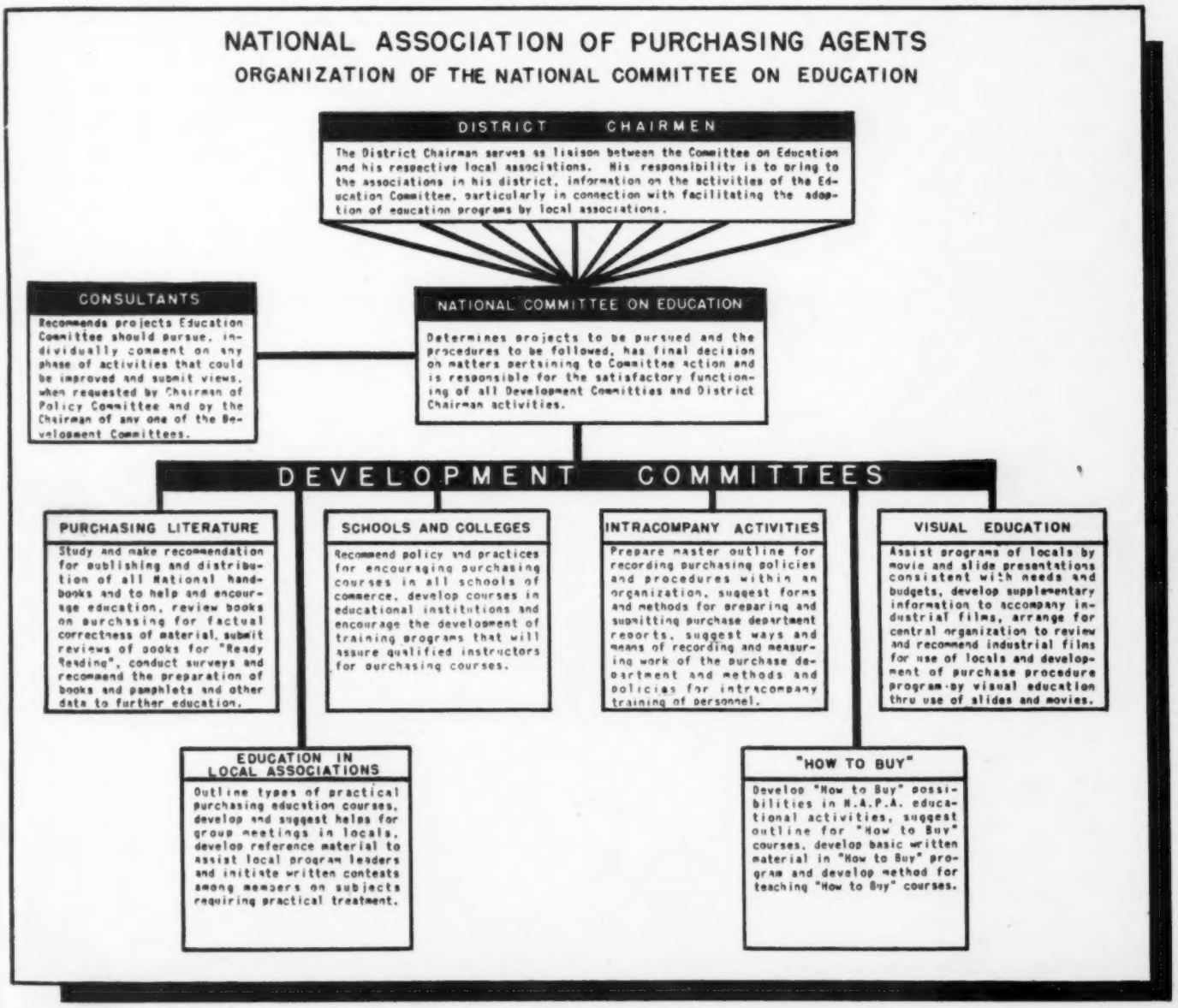
We believe wholeheartedly in this idea of education; we know that purchasing people on the job, whether it be in industry or government, can do a better job by study and observation, by learning more about it. Since the second largest expense of government is for supplies, the importance of efficient supply operations becomes paramount to some fifty million taxpayers. There are thousands of Federal, State and Municipal employees involved in various phases of the supply job.

Accordingly, meetings were held with representatives of public purchasing men interested in the idea; leaders in the National Institute of Governmental Purchasing, the State Council for Purchasing Officials, the Government Branch of the National Association of Purchasing Agents, the U. S. Chamber of Commerce, and others, to develop plans for the National Academy of Public Purchasing. The cooperation was enthusiastic and we will have in attendance for the first session this winter a group of outstanding State, County, City, also Federal purchasing officials to initiate the program. Its purpose is to exchange "know how", to pool knowledge in purchasing, and to improve public purchasing practices and procedures.

There is another important point I would like to make in connection with these educational programs now available to purchasing people in industry and government. The objective we are after goes beyond merely teaching how a thing is done — or even why it is done. The idea is to develop imagination and resourcefulness in the employee and the supervisor as well. Know the job, do it thoroughly, but be alert constantly for ways and means to improve it — and yourself.

We must encourage improvements and advances in scientific and social progress with greater energy than ever before. Today we have more opportunity to develop and improve ourselves. We have the priceless right of choosing our own field of endeavor. We also have the right of increasing our own abilities in that chosen field. Purchasing is no exception.

Education and progress are not static matters. They go hand in hand. The rung of a ladder was never meant to rest on, but only to hold a man's foot long enough so that he could put the other higher. If knowledge is constantly pursued, progress is the inevitable result.


NATIONAL ASSOCIATION OF PURCHASING AGENTS
ORGANIZATION OF THE NATIONAL COMMITTEE ON EDUCATION
DISTRICT CHAIRMEN
The District Chairman serves as liaison between the Committee on Education and his respective local associations. His responsibility is to bring to the associations in his district, information on the activities of the Education Committee, particularly in connection with facilitating the adoption of education programs by local associations.
CONSULTANTS
Recommends projects Education Committee should pursue, individually comment on any phase of activities that could be improved and submit views, when requested by Chairman of Policy Committee and by the Chairman of any one of the Development Committees.
NATIONAL COMMITTEE ON EDUCATION
Determines projects to be pursued and the procedures to be followed, has final decision on matters pertaining to Committee action and is responsible for the satisfactory functioning of all Development Committies and District Chairman activities.
DEVELOPMENT COMMITTEES
PURCHASING LITERATURE
Study and make recommendation for publishing and distribution of all National handbooks and to help and encourage education, review books on purchasing for factual correctness of material, submit reviews of books for "Ready Reading", conduct surveys and recommend the preparation of books and pamphlets and other data to further education.
SCHOOLS AND COLLEGES
Recommend policy and practices for encouraging purchasing courses in all schools of commerce, develop courses in educational institutions and encourage the development of training programs that will assure qualified instructors for purchasing courses.
INTRACOMPANY ACTIVITIES
Prepare master outline for recording purchasing policies and procedures within an organization, suggest forms and methods for preparing and submitting purchase department reports, suggest ways and means of recording and measuring work of the purchase department and methods and policies for intracompany training of personnel.
VISUAL EDUCATION
Assist programs of locals by movie and slide presentations consistent with needs and budgets, develop supplementary information to accompany industrial films, arrange for central organization to review and recommend industrial films for use of locals and development of purchase procedure program by visual education thru use of slides and movies.
EDUCATION IN LOCAL ASSOCIATIONS
Outline types of practical purchasing education courses, develop and suggest helps for group meetings in locals, develop reference material to assist local program leaders and initiate written contests among members on subjects requiring practical treatment.
"HOW TO BUY"
Develop "How to Buy" possibilities in N.A.P.A. educational activities, suggest outline for "How to Buy" courses, develop basic written material in "How to Buy" program and develop method for teaching "How to Buy" courses.

POINTERS FOR PURCHASING PAPER BAGS

● *By E. L. Cady*

An everyday packaging product is adapted to meet many special requirements and conditions of use by taking advantage of varied physical properties and methods of construction

THE properties and qualities of paper bags may be important at several stages in the packaging, selling and use of a packaged product. For example:

1. At the bag filling machine or operation. The type of bag selected can have considerable influence upon the costs to fill and seal and the practicability of using either a mechanical operation or hand labor.
2. In storage after filling, either at the plant which does the filling or at the points of sale or use.
3. During shipment and in the rehandling incident to shipment by railroad, ship, over-the-road truck, perhaps by farm truck over rough fields to the final point of use.
4. At the point of merchandising and selling of the packaged product. This may include the practicality of the purchaser carrying the package home if the packaged product is moist, wet, or has other bothersome features.
5. For possible secondary use, as laundry bags are refilled with dirty clothes for return to the laundry, or as a foods bag may become a lunch bag or a crushed ice bag be used for garbage disposal.
6. For use as part of the packaged product, as an entire package of coal may be thrown into the furnace without first opening the bag. This classification is certain to grow, and it must be watched with care. For example, the cement bag which can be tossed unopened into a concrete mixer where it will break up into a useful aggregate is, so far as we know, still in the dream stage but it is almost certain to be perfected.
7. For reprocessing of a product without unpackaging it, as packages of ice cubes may be removed from a truck and placed in a cold chamber for refreezing while still in the packages, and as other products might be re-moistened, reheated or re-dried. This is another use that seems certain to grow.

One problem is the bewildering variety of conditions which bags must surmount. At the same minute that rough labor in a wood working plant is using a former to fill bags with shavings and odd pieces for sale as kindling and is judging "by scale and by eye" the proper filling level, a completely sanitized automatic machine in a foods plant is filling hundreds of tiny bags a minute with weight differences measureable only in fractions of a gram, and a high grade mechanic in a machine shop is taking all day to package an entire machine tool in a single bag with all air to be evacuated and the final opening to be heat sealed before the air can re-enter. Bags for some kinds of fruit must be highly permeable to the carbon dioxide which the fruit gives off while in storage and shipment, lest the fruit be made liable to

Cubed ice is packaged in 50-pound quantities in wet strength bags for serving hotels, restaurants, bars, and stores. Securely wired at the top, the bags protect the ice from dust and dirt during delivery, and the paper acts as an insulator against heat. The bag is a convenient, economical, non-returnable container.

Potatoes are cleaned and sorted at the shipping point (a Grange League Federation warehouse at Calverton, Long Island) and packaged in 10, 15, and 50 pound quantities, in wet strength paper bags.

Bag making is a highly mechanized operation; selection of standard types and sizes is the best purchasing practice.

The customer's customer is important. Wire handles are applied to potato bags for easy carrying.

(Photographs by Drix Duryea, George Philip Sauter, and Alfred Losch; courtesy of Union Bag & Paper Corporation)

rapid ripening and also to softening and rotting. Bags for other products may inhibit the growth of weevils and other unwanted organisms in the packaged product.

In a brief article it would be impractical to attempt the listing of half the conditions which various bags must meet, even if nothing else were to be presented.

In the face of this variety of uses, bags are made of paper and paper is made on machines which are high in tonnage output but low in their adaptabilities for changing from one product to another. Bag making machines and some of the coating machines and other equipment are more flexible. But excepting the rather easily obtainable special sizes of bags and the always obtainable special printing on bags, the purchasing agent cannot buy special bags with the ease that applies to such items as special alloy castings. Completely standard (excepting for the printing) bags always are the best bet when they can be used.

When the bag is to be especially adapted to its purpose, or when a study is to be made to find a bag more fully adapted to all the conditions it must meet, then the purchasing agent has an excellent opportunity to consider the needs of his house, and of his customers, and of his customers' customers, and then to cooperate with a well selected list of bag makers and find the products which best fit the conditions. Bag buying requires completely cooperative thinking, and this is purchasing in its most modern form.

Test Specifications

Tests for bag properties and qualities include actual field experiences, laboratory type tests, and simulated service tests.

The simulated service tests require ingenuity on the part of the bag maker and the purchasing engineer, plus wisdom in the interpreting of results, and sometimes considerable thoroughness. And they must be thoroughly confirmed by laboratory results.

In one instance, bags for long term storage of sugar were wanted. The sugar is hygroscopic; it will absorb any moisture that reaches it. The standard (TAPPI) test for moisture penetration consists of putting a standard quantity of a highly hygroscopic material such as calcium chloride in a standard cup, clamping the sheet of paper over the mouth of the cup in a standard manner which prevents leakage of air between paper and cup, and placing this setup in a chamber which maintains a temperature of 73 degrees Fahrenheit and 50% relative humidity. The setup is weighed before placing in the chamber, is left there for 8 days, and is then removed and re-weighed. It is considered that all moisture gain during the first day represents adsorption on the surface of the paper; therefore the gain in weight is interpreted to be the gain by the calcium chloride of moisture which has penetrated the moisture barrier represented by the paper. The gain is expressed in grams per square foot per 24 hours.

The paper having passed this test, a more severe one in which the temperature is 100 degrees F. and the relative humidity 90% is used.

The Union Bag and Paper Company set up a simulated service test

Good merchandising practice: The Vent-Vu bag provides excellent visibility of product and space for brand printing on four sides of the package. At left, one of these bags has been opened up to show how cotton mesh is securely bonded in place between two layers of kraft paper.

which was a mildly severe approximation of actual field conditions. Actual bags of sugar were stored for 6 months on racks in a room which was kept at constant temperature and humidity. The sugar failed to suffer moisture damage. And this result was confirmed by field experience when sacks of sugar, the bags being the ones especially developed, were stored in warehouses.

Likelihood that bags would be injured by puncturing, rupturing or bursting while in transit in freight cars or in trucks, or by such mishandling as being dropped from the tail boards of trucks, might be measured by such standard laboratory means as tensile tests, tear tests and Mullen (bursting strength) tests of the paper. But there is a drop test which is at once a practical simulated service and a standard laboratory test of the bag itself.

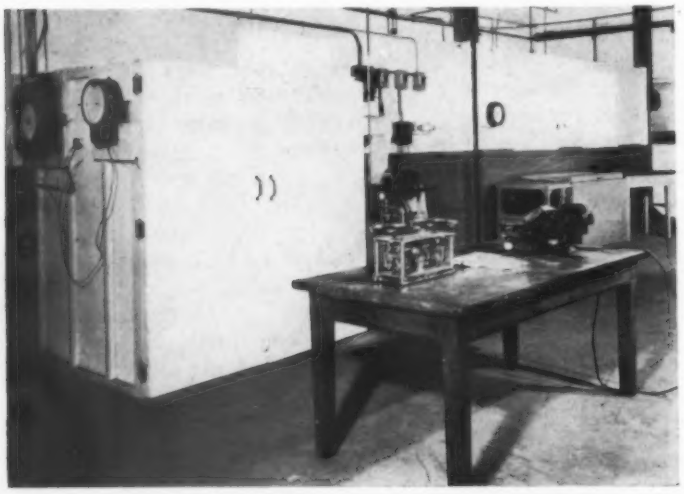
In this the bag is filled with the contents it is to package, is closed and sealed, and is laid flat on a platform. The platform is hoisted a few inches, the platform opens and allows the bag to fall to the floor. The bag then is turned over, replaced on the platform, and dropped from a higher distance, the process continuing until the bag fails or the test is considered helpless to break it. The drops are added together. If the first drop was 48 inches and the second 52, then the test is recorded as 100 (48 plus 52) inches of drop. The final score thus is in total inches. Some bags have survived 6,000 inches, but this is unusual since only under war or other excessive conditions would such strength be needed.

Practical experience indicates that 275 inches of drop is adequate for cement bags, 100 inches for flour (although 200 commonly is specified as a factor of safety) and that only rarely is more than 325 inches needed for any product to be shipped to a domestic market. Bags for foreign shipment may have special specifications. The amount of drop necessary depends upon such factors as the shock absorbing abilities of the bag contents and the angle of rest of the contents under shock, since this somewhat governs the likelihood that the contents will expand sideways and throw greater stress on the paper, and the tendency of the material to compact and put local stresses on the paper rather than distributing the stresses.

Usually, so far as the paper itself is concerned, the results of the drop test are in satisfactorily close relationship to the tensile, tear and Mullen, and the drop test then becomes mostly a test of the method and skill with which the bag has been closed and sealed. But the rapidly developing crepe bags show how one test can contradict another.

Crepe paper shows lower tensile strength than the same stock uncreped, yet the creped stock may withstand four to five times more drop. No reason for this has been assigned on a scientifically measured basis, but it is easy to assume that the ability of the creped paper to stretch resiliently would account for its superiority under drop testing.

The advantage of the crepe is not alone in superiority under drop testing, since uncreped stock usually is adequate in this respect, but is in superior coefficient of friction while filled bags are piled and are in transit. In one instance piles of bags which packaged large round cabbages stood up perfectly when creped bags were used, but with uncreped bags it was impossible to keep from collapsing the piles and rupturing the bags against the sides and doors of the freight car. In another instance a car was loaded at one end with creped and at the other with uncreped bags and both piles were refrigerated with top ice. The ice stayed in place on the creped bags but not on the un-



The modern development and control laboratories in the bag industry are equipped for standard and special tests of physical properties under fixed conditions of temperature and humidity.

creped.

Lightening of the paper stock weight may be possible when further field experience has been had with creped papers. That this will reduce the number of pounds of paper used per thousand bags and hence the costs and the tare shipping weights, may be less important than that it will permit more rapid and economical bag closing and filling operations.

Creping can be varied in amounts (or degrees) and in patterns. The greater the amount the more the stretch under stress and the less the elastic recovery of that stretch. The development engineers of one house believe that a range of 4% to 20% creping will cover most bag work. As an example of values, a 20% crepe in a common bag paper will permit the stock to stretch as much as 8 to 10% under drop tests or other stresses, with sufficient of quick elastic recovery so less than 5% of permanent stretch remains in the stock, the rest of the stretchability thus being retained for the cushioning of further shocks or stresses.

Crepe patterns may be varied for decorative effects and for other purposes. One is so made that if two crepe sheets are placed face to face, or if crepe bags are piled, the bossed portions meet in such manner as to create dead air cells which have high thermal insulating values. This can be advantageous when temperature stability of a quantity of bagged goods in a warehouse or in transit is important. When a few more such kinks have been worked out, the already wide range of uses for crepe bags will be greatly extended. But like so many of the new bag papers and other materials, the old standby laboratory tests such as tensile, tear, stretch, fold, smoothness, porosity and size, are proving less than adequate for predicting performances in the field.

Special Conditions

Bags have been filled with phenolithic resins at 280 degrees Fahrenheit. The bag was closed nearly all the way, placed in a wooden form, filled, finally closed, and the liquid resin permitted to cool to room temperature and thus to solidify to the contours imparted by the wooden form. Demonstrations that bags can be made of paper so dense that molten resin will not penetrate it, lead to predictions that in the near future bags which may char under flame but will not support combustion may make their appearance. Formulas for making the necessary papers are known, and with a few more ship explosions and warehouse holocausts the demands for such bags may bring them onto the market.

Porosity, as measured by the seconds per cubic centimeter required for passing air at a given standard pressure through a square inch of the paper, can be important if the bag is filled from pneumatic lines and the air must escape as the bag fills. In ordinary cement bags the porosity usually is 10 seconds, but porosities higher and lower than that can be applied where conditions require them.

The special coating and impregnating of bag papers to create water, moisture, oil and other barriers, and to build up wet strength and other properties, is a well established practice which is due for new developments.

Many of the treatments, especially those which created vapor barriers, were prone to make the paper somewhat brittle, so that the bags would fail under fewer inches of drop testing. Indeed, many of the multiple wall bags had inner bags of ordinary bag stock which would take the stress and strain of the contents, second or middle bags which were excellent water and vapor barriers, and exterior bags high in wet strength so they would take the stresses and abrasions of handling whether wet or dry. The inner and outer bags, then, protected the barrier-type middle bag.

Such bags still are the very best for many purposes. But well developed plans are afoot to include more plastics both as ingredients of the papers themselves and as coatings. The use of elastomers, of coatings proven to have higher anchorage strengths to the papers, of dispersants which avoid the solvents problems of some plastics and of various tars, are only a few of the new features which may be found in bags within the near future.

Wet strength is a similar problem. As applied to paper, the term does not mean that the stock is impenetrable by water and therefore is "waterproofing" to the packaged contents, but that the paper itself retains high amounts of its dry strength after being soaked in water for given time periods.

Some of the newer wet strength papers not only are higher in this property, but also are treated to be much less hygroscopic to the water. This means that they do not soak up so much water or moisture when exposed, their tare weights are not so much increased by water weight if exposed, the amounts of water to be removed when drying them out are less.

A 100-pound multi-wall bag being sewed preparatory to drop-testing at Union Bag & Paper Corporation's Products Development Laboratory, Hudson Falls, N. Y.

While these modern and somewhat dramatic developments are in the offing, the old standby asphalts and waxes and other coatings and impregnants are still capable of further progress. And in their traditional forms these products can solve thousands of packaging problems for which they have not as yet been tried.

Different Types of Bags

Paper of the kinds ordinarily used in bags must be made in large quantities if the price is to remain low, and within those quantities is not too easy to vary into special features. In spite of this the bag industry has created hundreds of types and qualities of bags, is busily creating more out of well known types and treatments of well known papers, and will create still more as new bag materials come along.

Unless he is prepared to buy in very large quantities, the purchasing agent rarely can have a special paper or a specially treated paper bag designed to fit his needs. But out of all the types and sizes now available it is possible to use almost endless purchasing vision in finding the ones best fitted to individual conditions, and the simulated service and practical field tests which will prove them so. With this adapting of present types must go watchfulness for the better ones which may come along for specific conditions. But this is only one more factor which makes the paper bag industry what it is: a constant challenge to the best in purchasing practices.

Harry E. Conrad, Executive Secretary of ASTE and general manager of the industrial exposition.

William Bradford Peirce, President, American Society of Tool Engineers.

James D. Mooney, President of Willys-Overland Motors, principal speaker at ASTE annual banquet.

TOOLS FOR INCREASED PRODUCTION

ASTE Tool Show to be held in Cleveland will feature two hundred exhibits showing newest developments in machines, tools, and methods; visits are scheduled to plants employing modern production techniques

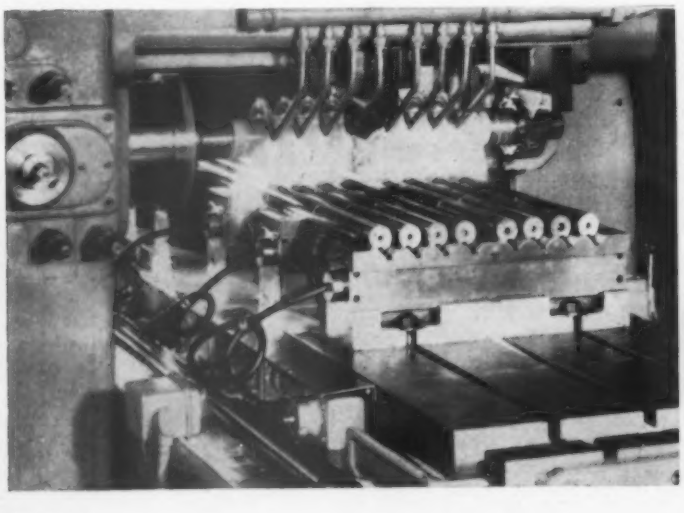
ONE of the nation's outstanding industrial expositions, the American Society of Tool Engineers' Sixth Industrial Exposition, is scheduled to be held in the Public Auditorium, Cleveland, Ohio, March 15-19, in conjunction with the Society's annual convention.

Indications are that this will be the largest and the most comprehensive exhibit of new processes, tools and machinery in the history of industry, according to exposition officials. It is expected that the show will surpass greatly in size the ASTE New Era Exposition of 1946 which drew more than 50,000 invited visitors.

The theme of the exposition is increased production and lower production costs to combat the rising tide of inflation—increased production now made possible with the new tools and methods which will be on display and in operation at the show.

Here will be shown a tremendous array of the newest and most efficient tools and machines as well as educational presentations of the latest processes, methods and techniques for

1. Power-Grip magnetic Viking chucks holding for keyway milling, will be demonstrated by Rockford Magnetic Products Co.



2. Micro-Mills for finishing bottom of blind holes or facings shoulders and ends of parts. Shown by Severance Tool Industries.

cutting costs and improving quality in every field of metal working. The country's leading manufacturers will be represented by more than 200 exhibits.

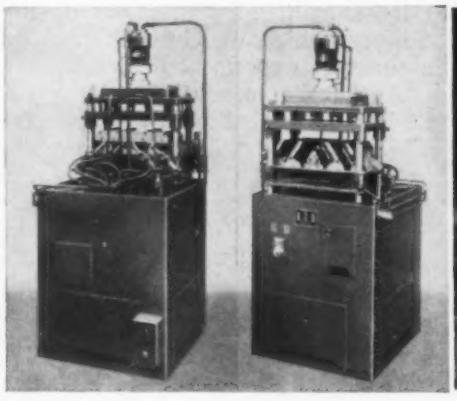
Thus it is a meeting of definite importance, must know that their supchasing agents who must collaborate with their own engineering and departmental heads in the acquisition of new equipment, and, of equal importance, must know that their suppliers' plants are up-to-date and equipped with the improved production facilities that make for increased efficiency, the right quality, dependable delivery of the right quantity, and lower production costs.

For them this huge industrial fair might be considered as an educational laboratory. Here they will have the opportunity to see the latest in tools and processes at close range. They will observe them in actual operation, and have the opportunity to discuss their merits and advantages with the builders. And of special importance, they will be able to compare at one showing the products offered by competing manufacturers.

The importance of the exposition from the standpoint of buying tools and equipment for their own plant cannot be overestimated. It is a known fact that an alarming number of machines and methods which figured so importantly in our wartime productivity and which were considered a marked improvement, are now obsolescent.

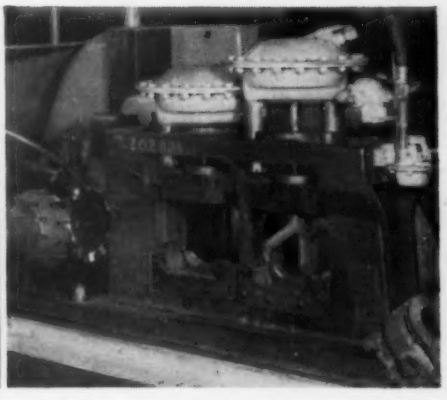
Furthermore, machines and tools functionally are becoming highly standardized, and with the exception of that equipment that is created especially for unusual jobs and services, many types of machine tools and equipment are quite competitive. It is a part of good buying to have complete information available about competitive materials and sources available, when the need arises. As pointed out, there will be exhibits and demonstrations of competing tools and equipment at the exposition, and technical information and printed matter will be available to purchasing agents for their files.

Tying in with the opinion that an increase in the efficiency of work-handling is today one of the most urgent needs in all phases of manufacturing, the meeting Monday evening, March 15, will be devoted to develop-

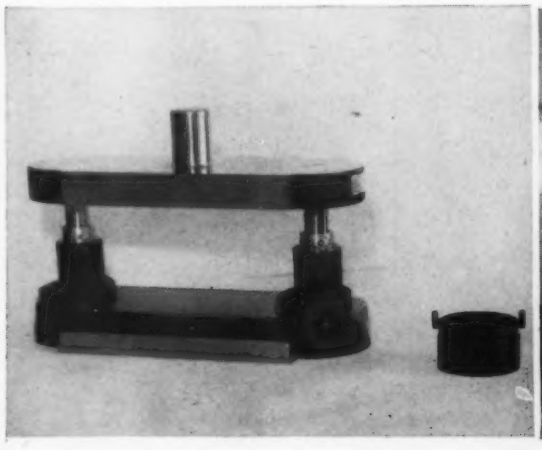


3. Zagar Hydraulic Drilling Machine will be demonstrated, drilling more than 200 holes in gas burners at one operation.

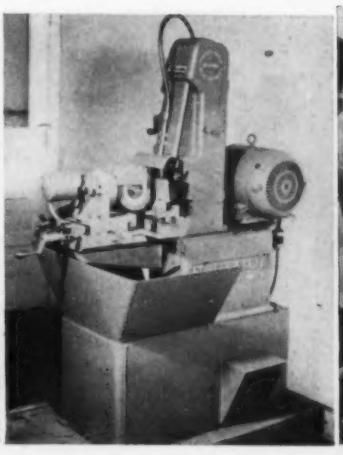
4. Morse Twist Drill & Machine Company's Hi-Helix end mill, operated at 30° angular cut to depth of ⅜" without lubricant.



5. Robotair installation for clamping small cylinders during a duplex milling operation. Bendix-Westinghouse Automotive Brake Co.

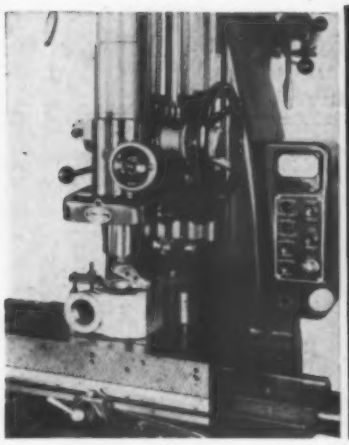


6. Anti-friction die set, exhibited by Evans Reamer & Machine Co., is claimed to save up to 50% in die setter's time.



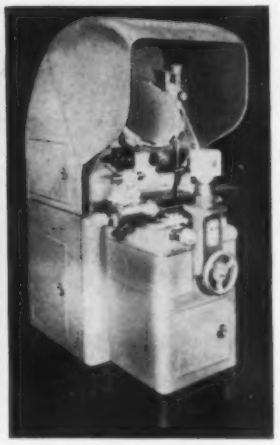
7. Wet-or-dry belt centerless grinders will be among the equipment shown by the Porter-Cable Machine Co.

8. Moore Special Tool Co. will show locating microscope that reverts image, gives direct view of irregular contours too small for an edge finder.



9. New large jig borer shown by Moore Special Tool Co. has maximum boring capacity of 4″ on tool steel, 5″ on soft steel.

10. Bench model drill press exhibited by South Bend Lathe Works, along with new 7″ precision shaper and new 14″ drill press.



11. Heavy duty pedestal comparator with 14″ diameter screen and power elevated table, in the Jones & Lamson Machine Co. exhibit.

ments in simplifying work handling. At this seminar, Allan H. Mogensen, Industrial Consultant and Director of the Lake Placid Work Simplification Conference, will present a paper on "Work Handling Simplification".

Tuesday evening, "Dies—Control of Deep Draws and Irregular Shapes" will be the subject presented by N. E. Rothenthaler, Superintendent of Production and Planning, Steel Operations, Ford Motor Co.

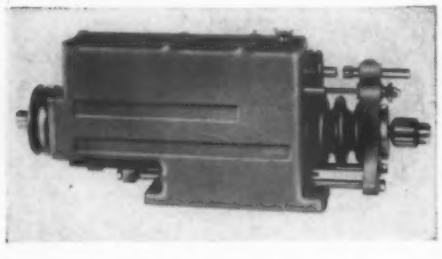
The ASTE program committee points out that recent developments in the field of deep drawing of metals have increased production, cut costs and made for greater efficiency in many industries using metal stampings. It is thought that a wider use of newly developed techniques will help other manufacturers to meet increasing production schedules. This should prove of great interest to men in purchasing.

A "quiz program" labeled "The Tool Engineers' Quiz" will feature the Wednesday evening meeting. It will be held under the chairmanship of Robert W. Ford, chairman of the ASTE national program committee. The committee will select 25 questions submitted by members of the Society, which will be answered by a panel of experts at this session.

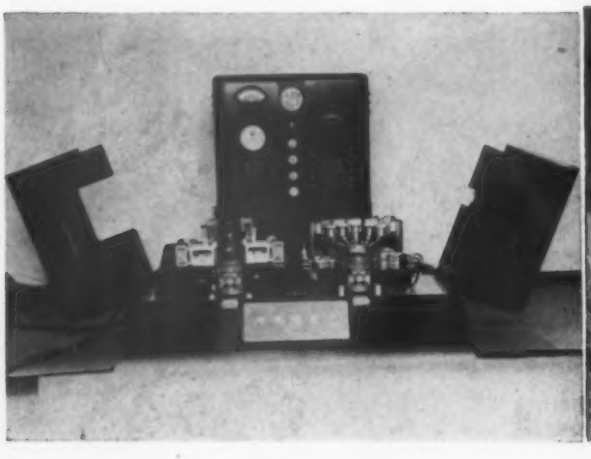
All of the technical sessions will be held in the ballroom of the Hotel Cleveland, and will begin promptly at 8:00 PM.

Plant Tours

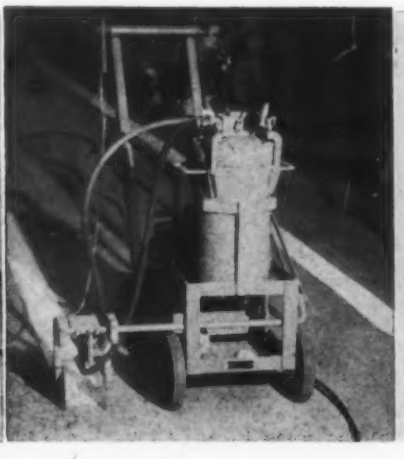
A feature of the meeting is a series of plant tours that have been scheduled for each of the four days. The program committee states that the plants selected for visitation have been placed on the schedule because they represent the manufacturing and research establishments in the Cleveland area in which innovations in processes and methods have recently occurred.



12. Automatic drilling and tapping power unit, which will be among the exhibits of the Locke Gage Co.

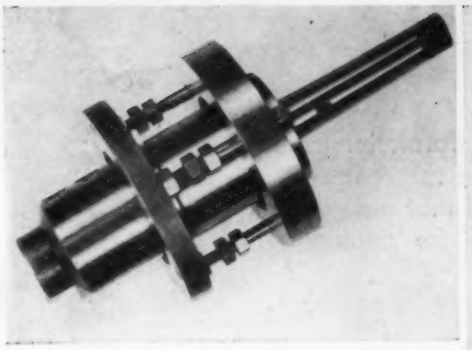


13. Multiple station piston gage shown by Pratt & Whitney Div., Niles-Bement-Pond Co., is part of a wide line of quality control equipment.

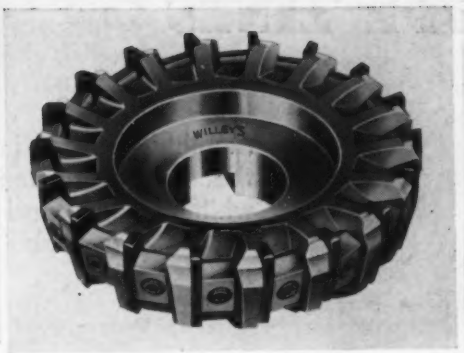


14. Traffic line markers for industrial use, powered by either gasoline engine or electric motor, displayed by Industrial Tools & Products Corp.

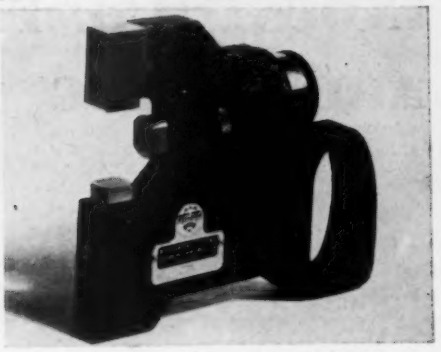
15. Magnetic Coolant Separator made by Barnes Drill Co. automatically and constantly cleans coolant, permanently removes swarf.



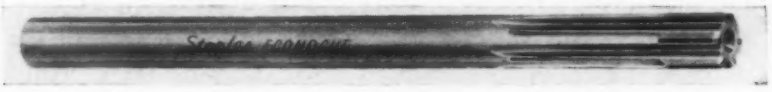
16. Shown for the first time by Weddell Tools, Inc., is a line of inserted blade metal cutters incorporating solid carbide 3/8" Tri-Bit.



17. Radial face mill for cast iron milling — straight face operations and heavy rough — with from 8 to 28 solid carbide blades, featured by Willey's Carbide Tool Co.



19. Improved dial snap gage with vernier type adjusting stud and frame of rolled magnesium, among the exhibits of Nilsson Gage Co.



18. Staples Tool Company will show a line of carbide reamers in sizes from 1/4" to 5/8".

Chairman Ford points out that in nearly every instance these plants offer ideas which will find practical application in the industries represented by the visitors.

Visitors will register for plant tours and receive tickets. Transportation for the tours will be furnished free to registrants. The timetable for the plant tours is as follows:

Monday, March 15, 1:00 P.M.; The Warner & Swasey Co., Ohio Crankshaft Co., White Motor Co., and Fisher Body Div., General Motors Corporation.

Tuesday, March 16, 9:00 A.M.: National Acme Co., White Motor Co., General Electric Co. (Nela Park), the Weatherhead Co., and Reliance Electric & Engineering Co.

1:00 P.M.: The Warner & Swasey Co., Ohio Crankshaft Co., Fisher Body Div., and Republic Steel Corp., (strip mill).

Wednesday, March 17, 9:00 A.M.: The National Acme Co., General Electric Co. (Nela Park), Weatherhead Company.

1:00 P.M.: The Warner & Swasey Co., Ohio Crankshaft Co., White Motor Co., Fisher Body Div., Jack & Heintz Precision Industries, Inc.

Thursday, March 18, 9:00 A.M.: The National Acme Co., White Motor Co., General Electric Co. (Nela Park), Weatherhead Co., Reliance Electric & Engineering Co., and Jack & Heintz Precision Industries, Inc.

1:00 P.M.: The Warner & Swasey Co., Ohio Crankshaft Co., Fisher Body Div., and The National Advisory Committee for Aeronautics Laboratories, Cleveland Airport.

Friday, March 19, 9:00 A.M. General Electric Co. (Nela Park), and the Weatherhead Company.

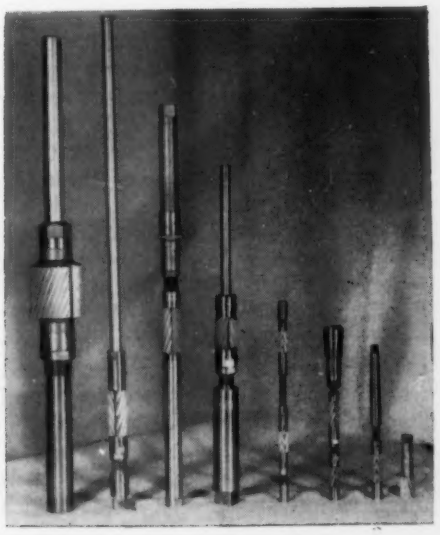
The ASTE annual banquet, which will be held in the Hotel Carter, Cleveland, Thursday, March 18, will be featured by an address by James D. Mooney, president and chairman of the board, Willys-Overland Motors.

20. Service Machine Company's new 25-ton press with adjustable table to accommodate dies from 6" to 17".

21. Acme-Morrison metal stitcher, exhibited by Acme Steel Co., is shown stitching steel to aluminum in fabricating an electric range drawer.

22. The Do-All Company's exhibit will include this precision diamond band sawing machine for contour sawing of hard metals and vitreous materials.

23. Interesting assortment of special adjustable reamers designed for special job requirements by Evans Reamer & Machine Co.



INDUSTRIAL PIPE LINES ARE FILLING

Monthly delivery information reports reveal that long lead time requirements are being whittled down, and that many items are fast becoming available for shipment from stock

A YEAR ago this month, PURCHASING Magazine inaugurated the Product Delivery Information report which appears on the opposite page. The report is prepared each month from information furnished by manufacturers.

While it is obviously impossible to publish a report that would embrace all of the items that are on the commodity and supply lists of industrial purchasing agents, or even any great proportion of them, it has been the aim to compile a representative list of industrial items and the manufacturers' delivery time therefor, that would be indicative of supply trends, as well as being a practical help to buyers and users of materials by directing particular attention to items on which long lead time is required.

Checking back through the reports that have been published during the past twelve months, it is noted that there is an ever increasing number of items whose deliveries are now shown as being *Immediate* or *From Stock*, or *Stock to two weeks*, etc., indicating that shortages in certain lines are slowly but surely being overcome. There are many instances in which a complete line is not yet available to buyers, but where certain items in a line are ready for immediate shipment.

In other words, the Product Delivery Information report has consistently evidenced that manufacturers are rapidly catching up with backlogs in many types of manufacture, and that the once-empty pipelines, of both big-inch and little-inch stature, are being filled.

Of course, steel and the products of the steel industry are still on a quota or allocation basis, and apparently will be for some time to come. Yet it is interesting to note that the "years" and "months" that previously characterized lead time information on many items employing steel as a raw material have been whittled down to "months" and "weeks" respectively.

For instance, the April 1947 report stated: "Civilian Products Administration states 1946 ended with a backlog of 40,266,000 fractional horsepower motors—Delivery time, two years". The report for the current month shows the present situation to be *one to five months* for standard items in this line, *two to five months* for special orders.

Iron and steel valves that previously called for a delivery time of *one to three months* and *one to two months* respectively, are now reported as *Stock to 60 days* and *Stock to 90 days* respectively.

Turbine pumps which showed *four to eight weeks* delivery time a year ago, are now reported as *Stock to four weeks.* Sprockets have dropped from *four to eight weeks* to *Stock*, although some items in this category, cut-tooth steel and cut-tooth cast iron sprockets, still indicate a *6 to 12 months* and *8 to 15 months* delivery time respectively. Portable platform scales have dropped from *4 to 8 months* to *Stock to 2 months.* And a manufacturer of spray painting equipment states that his company has worked off the tremendous backlog of orders for standard spray painting equipment that has been handicapping deliveries for several years, and can now give immediate delivery on virtually all standard items shown in his catalog.

The current report includes a listing to the effect that standard lathes, milling machines and shapers are available at once from distributors.

Just the reverse of the foregoing, and probably reflecting the industry-wide interest in cutting the cost of material handling, is the increased delivery time now reported for certain types of such equipment as compared with a year ago. Electric industrial tractors which last April had a delivery time of *three months*, are now reported as *four months.* Fork trucks which then had delivery times of *1 to 3 months*, now call for *5 to 6 months.* Factory trailers which at that time required but *6 to 12 weeks* delivery time, in this month's report show *8 to 12 weeks.* Conveyor belting, however, has dropped from *9 to 12 months* delivery time down to *three weeks* in the current report.

There has been a material change in the copper and brass situation, and the improved condition is in decided contrast with the March 1947 report, which stated that the "raw material situation is critical" and that the copper shortage amounted then to 500,000 tons. Delivery time on brass fittings was then placed at *3 to 5 months*, whereas the current report shows some items to be on a stock basis. This month's report lists bronze parts, extruded bronze, and bronze castings as having a delivery time of *2 to 3 weeks*; bare copper wire, *3 to 4 weeks*; brass strip and wire, *three weeks*; and copper tacks and nails, *2 to 3 weeks.*

Also, a year ago, it was reported that box and paperboard manufacturers were "experiencing a state of confusion", whereas their situation today shows decided improvement.

A comparison of this report with similar lead-time records maintained by several industrial purchasing agents showed that in some cases there was considerable variance between their data and that furnished by manufacturers for use in this report. Readers can readily find many reasons for this differential.

In view of the extreme shortages that have existed, and the large number of new companies that have developed incident to the war and in the postwar era, some sales managers have apparently been reluctant to release information that would apply to long established accounts, for it has not been within their power to offer a like service to new customers or to the industrial field in general.

On the whole, the Product Delivery Information report has been highly commended by both sales managers and purchasing agents. It has proved its value as a purchasing guide. And while deliveries are steadily improving, the problem of lead time continues to be an important factor in purchasing programs. The monthly report will be continued so long as this situation prevails, until supply and demand in the industrial field are in better balance.

PRODUCT DELIVERY INFORMATION

IT will be noted that this month's report shows that various types of motors are available from stock. Otherwise there are no major changes. Here and there a week or more, or a month, has been lopped off delivery time shown in previous reports.

Attention is directed to the article on the opposite page reviewing changes that have taken place since the Product Delivery Information report was inaugurated a year ago this month. It evidences that pipe-lines are filling up and that manufacturers in many lines are catching up with backlogs.

The delivery time shown represents in many instances the range of delivery reported by several manufacturers.

DELIVERY TIME	
Standard Products	**Special Order**
ABRASIVES, COATED	
1 to 3 weeks	3 to 4 weeks
ADHESIVES	
Industrial Adhesive Tape	
2 to 6 weeks	6 to 8 weeks
Elec. Cloth Adhesive Tape	
2 to 6 weeks	6 to 8 weeks
AIR EQUIPMENT	
Compressors	
2 to 3 months	1 to 4 months
Pumps, Vacuum	
2 weeks	2 months
ALUMINUM	
Sheet & Coil Products	
12 weeks	12 weeks
Extrusions	
4 to 5 weeks	6 weeks
Rod and Bar	
2 to 4 weeks	3 to 5 weeks
BEARINGS	
Babbitt Metals, All Grades	
1 to 7 days	3 to 10 days
Steel Balls	
1 to 3 months	3 to 6 months
Retainers	
2 to 4 months	4 to 6 months
Bearings	
10 days to 4 months	3 to 5 months
Balls, Non-Ferrous	
1 to 3 months	3 to 6 months
Bearings, Roller	
2 to 4 months	3 to 5 months
BELTING	
White Solid Woven Cotton	
Stock — 2 weeks	1 to 3 months
Canvas Stitched	
Stock — 4 weeks	1 to 2 months
Balata	
Stock — 2 weeks	4 to 6 weeks
BRASS & COPPER MILL PRODUCTS	
Brass Strip (Gauges over .016)	
3 weeks	— —
Brass Sheet, under 12"	
3 weeks	— —
Brass Sheet, over 12"	
5 to 7 weeks	— —
Brass Rod Special	
— —	3 weeks
Brass Wire	
3 weeks	— —
Seamless Copper Tube	
3 to 5 weeks	— —
Soft Copper Tube, Coils, under 1"	
8 weeks	— —
Soft Copper Tube, Larger Diameter	
4 weeks	
BRONZE PARTS	
Extruded Bronzes	
2 to 3 weeks	3 to 4 weeks
Light and Heavy Bronze Castings	
2 to 3 weeks	3 to 5 weeks
BRUSHES	
Power Driven	
1 to 3 weeks	3 to 4 weeks
Paint & Varnish Brushes	
1 to 3 weeks	3 to 4 weeks
Wood Handle Wire Scratch, Wire Wheel and Wire Flue and Tube	
1 week	2 weeks

DELIVERY TIME	
Standard Products	**Special Order**
CHAIN	
Steel	
1 to 12 months	1 to 6 months
Malleable Iron Chain, Light	
30 months	30 months
Malleable Iron Chain, Heavy	
8 months	10 months
Machine Finished Roller	
6 to 12 months	— —
Steel Chain	
6 to 8 months	8 to 9 months
Welded	
1 to 12 months	— —
Weldless	
3 to 12 months	— —
CHEMICALS	
"General shortage of rubber drums, steel drums, and carboys.	
Carbolic Acid	
Tight: Annual production committed under contract.	
Formaldehyde	
Very short supply.	
Chemical Process Equipment	
12 months	16 months
CLEANERS	
Parts Cleaners	
10 to 15 days	20 days
Solvents	
1 week	— —
COATINGS, PROTECTIVE	
3 weeks	5 weeks
COATING EQUIPMENT, INDUSTRIAL	
Baking Ovens	
6 weeks	10 to 24 weeks
Booths, Dry Type Spray; Water Wash	
6 weeks	— —
Spray Guns, Portable Equipment	
Immediate	— —
CONTAINERS	
Bags	
Cellophane	8 to 12 weeks
Glassine	4 weeks
Parchment	12 to 16 weeks
Preprint Wax	4 to 6 weeks
Window	4 to 6 weeks
Bags, Paper	
30 - 60 days	90 - 150 days
Bags, cotton & burlap	
10 to 30 days	30 to 90 days
Boxes, Corrugated	
— —	3 to 4 weeks
Boxes, Solid Fibre	
8 weeks	Spl. orders not accepted
Boxes, Fibre, Cleated	
12 weeks	2 to 5 months
Cleated Plywood, Shook	
8 weeks	6 weeks
Box Shooks	
— —	2 weeks
Boxes, Crates, Wirebound	
— —	6 weeks
Boxes, Wooden	
— —	4 weeks
Crates, Wooden	
— —	2 weeks
Lumber; Shavings	
Immediate	
Cooperage, Tight, Slack	
2 to 4 weeks	12 weeks
Paper Tubes, Cores, Cans	
— —	3 weeks

Standard Products	Special Order
Fibre Drums	
2 to 3 weeks	— —
ELECTRICAL	
Cables, Wire	
4 to 6 weeks	4 to 6 weeks
Cable, Insulated	
5 to 6 months	5 to 6 months
Cables and Wire	
4 to 6 weeks	4 to 6 weeks
Bare Copper Wire	
3 to 4 weeks	3 to 4 weeks
Weatherproof Wire	
3 to 4 weeks	3 to 4 weeks
Wiring Devices	
3 months	6 to 8 months
Conduits, Flexible	
1 to 5 months	1½ to 6 months
Raceway-Fittings	
60 days	90 days
MOTORS	
Integral HP Motors, 1 to 5 HP	
Stock to 60 days	3 to 6 months
Open Gen. Purpose Induction Motors (1-200hp)	
Stock to 3 months	3 to 6 months
Fan-cooled Gen. Purpose Induction (1-25hp)	
Stock to 3 months	3 to 6 months
Open Gen. Purpose d-c Motors and Generators	
Stock to 3 months	6 to 8 months
Fan-cooled or Encl. Non-Vent. d-c Motors	
— —	6 to 8 months
Open Motor Generator Sets	
— —	6 to 8 months
Large a-c Alternators and Synchronous Motors	
— —	8 to 9 months
Fractional hp	
1 to 5 months	2 to 5 months
Motor Control	
75% in stock	40 weeks
ELECTRODES	
3 to 4 weeks	6 to 8 weeks
ELECTRONIC EQUIPMENT	
Geiger-Muller Equipment	
1 week	60 days
ENGINES, GASOLINE	
Marine, Water Cooled	
Stock to 4 weeks	6 weeks
Light & Power, Air Cooled	
Stock to 30 days	6 weeks
Light & Power, Water Cooled	
Stock to 8 weeks	3 months
FASTENERS	
Cut Tacks & Nails	
1 month	— —
Small Wire Nails & Brads	
8 to 10 weeks	
Copper Tacks & Nails	
2 to 3 weeks	
Furniture Nails, Thumb Tacks	
3 to 4 months	— —
Bolts, Stove	
6 to 8 months	— —
Nuts	
6 to 8 months	— —
Nuts, Semi-Finished	
2 to 3 months	— —
Milled Specials	
— —	2 to 3 months
Screws	
4 to 5 months	4 to 5 months
Hex Head Cap Screws ¼-⅜"	
1 to 3 months	2 to 4 months
Hex Head Cap Screws 7/16 & ½"	
Stock to 4 months	2 to 4 months
Thread Cutting Screws	
14 weeks	14 weeks
Sems Fastener Units to No. 12	
14 weeks	14 weeks
Set Screws, All Dia.	
Stock to 16 weeks	— —
Wood Screws	
2 to 3 months	3 to 4 months
Machine Screws	
14 weeks to 6 months	5 to 7 months
Machine Screw Nuts	
12 months	— —

Standard Products	Special Order
Sheet Metal Screws	
4 to 10 months	4 months
Headless Set Screws	
6 to 8 weeks	6 to 8 weeks
Recessed Head Machine Screws	
4 to 6 weeks	3 to 7 months
Recessed Head Wood Screws	
14 weeks	14 weeks
Rivets	
4 to 8 weeks	10 to 12 weeks
Washers, Flat	
Indefinite	
Lock Washers	
1 to 2 weeks	4 to 6 weeks
Wood Screws	
1 to 2 months	2 to 6 months
FITTINGS	
Brass, Bronze	
Stock to 12 months	30 to 60 days
Copper or Bronze, Solder Type	
Stock to 60 days	
Tube Fittings, Brass & Steel	
Stock to 1 month	5 weeks
Malleable Iron	
Small quantities 60 days to indefinite	
Large quantities 9 months to indefinite	
Malleable & Cast Iron Screwed Pipe	
Immediate to 4 months (depending on item)	
Stainless Steel Fittings	
60 to 90 days	90 to 150 days
Steel Tube Fittings	
Stock to 60 days	2 to 4 months
FORGINGS	
— —	Brass or Aluminum 3 to 4 weeks
FURNACE — OVENS	
Electric Heat Treating	
3 to 4 weeks	6 to 8 weeks
Electric Salt Bath	
6 to 8 weeks	10 to 12 weeks
Ovens, Industrial	
4 to 5 weeks	6 to 12 weeks
Furnaces, Industrial	
4 weeks	8 to 14 weeks
GASKETS-PACKINGS	
Leather	
2 weeks	4 weeks
Oil Seals	
2 weeks	12 weeks
Felt Products	
2 to 3 weeks	3 to 4 weeks
Molded Parts	
3 weeks	4 to 6 weeks
Die-Cut	
	3 to 4 weeks
Blackrock Rings	
	5 to 7 weeks
Single Jacket Metal Asbestos	
— —	1 to 12 weeks
Ring Joint Stainless Carbon	
6 weeks	8 to 10 weeks
GAUGES	
2" and 2½" Pressure	
Immed. to 2 months	3 months
Ammeters	
3 months	3 months
Ind. Thermometers (bimetallic)	
1 month	1 month
Liquid Level Gauges	
1 month	1 month
Oxy-Acetylene; Vacuum; Compound	
30 days	60 days
Recording Gauges & Thermometers	
4 to 6 weeks	6 to 8 weeks
Pressure, Temperature Controls	
4 to 6 weeks	6 to 8 weeks
Recording & Controlling Pyrometers	
4 to 6 weeks	8 to 10 weeks
Linear Measuring Air Gauges	
2 to 4 weeks	2 to 6 weeks
Linear Measuring Electronic Gauges	
Stock to 2 weeks	2 to 4 weeks
Lin. Measuring Dial Ind. Gages	
Stock to 2 weeks	2 to 4 weeks

Standard Products	Special Order
Lin. Measuring Dial Indicators	
Stock to 2 weeks	2 to 4 weeks
GEARS	
2 to 8 weeks	10 months
According to size and type	
Differentials	
— —	10 months
GRINDERS-BUFFERS	
3 months	6 months
GRINDING WHEELS	
5 to 6 weeks	6 to 8 weeks
HEATERS, UNIT	
1 month	— —
HOSE, FLEXIBLE, ASSEMBLIES	
Stock to 2 weeks	30 to 90 days
HOSE	
Fire Hose	
3 weeks	— —
Hand Hose	
6 weeks	— —
Molded Braided	
3 weeks	— —
Machine Hose	
8 weeks	— —
Wrapped Hose	
Stock to 8 weeks	Stock to 8 weeks
Rubber Hose, All Types	
Stock to 30 days	30 days
INSULATION	
Mineral Wool Industrial	
1 to 3 months	— —
LEAD	
Pipe and Sheet	
2 to 3 weeks	4 to 8 weeks
LIGHTING EQUIPMENT	
Fluorescent	
Stock	30 days
Incandescent	
Stock	30 days
MACHINE TOOLS	
Standard Lathes, Milling Machines, Shapers	
Immediate from Distributors; Factory 45 days	
MAGNESIUM	
Sheet 4 weeks	
MATERIAL HANDLING EQUIPMENT	
Industrial Storage Batteries, Lead acid	
Stock to 4 weeks	6 to 12 weeks
Casters, Truck	
4 weeks	
Casters, Semi Steel Plate	
2 to 3 weeks	— —
Casters, Welded Steel Plate	
3 months	2 months
Assembly Conveyors, Belt	
3 weeks	10 weeks
Conveyors, Belt	
3 to 6 weeks	
Conveyor Belting	
3 weeks	Stock to 4 weeks
Conveyor Belting, Rubber	
10 weeks	6 to 7 months
Conveyors, Coal	
4 to 6 weeks	10 to 12 weeks
Conveyors, Gravity, Wheel or Roller	
2 to 4 weeks	— —
Conveyors, Inclined Belt, Stationary, Horizontal	
6 weeks	12 weeks
Elevators, Bucket	
4 to 10 months	5 to 18 months
Elevators, Hand	
1 month	4 to 6 months
Elevator Belting, Rubber	
10 weeks	6 to 7 months
Elevators, Portable Hand	
3 weeks	6 weeks
Elevators, Portable, Electric	
3 months	6 months
Elevators, Electric	
2 months	4 to 6 months
Elevators, Portable, Tiering	
1 to 4 months	2 to 7 months
Trucks, Hand	
1 week	

Standard Products	Special Order
Jack & Skid Systems	
4 to 6 weeks	60 to 90 days
Hand Lift Trucks	
Stock to 30 days	30 to 60 days
Stake and Rack	
8 to 10 weeks	4 to 5 months
Skids	
28 days	30 to 60 days
MOTORIZED LIFT TRUCKS	
Stationary Platform	
30 days	60-90 days
Low-lift Platform	
10 to 30 days	30 to 60 days
Low-lift Pallet	
10 to 30 days	30 to 60 days
High-lift Platform	
10 to 30 days	30 to 60 days
Tilting and non-tilting Fork	
10 to 30 days	30 to 60 days
Tractor	
10 days	30 to 60 days
POWER INDUSTRIAL TRUCKS	
Tractors, Gasoline Industrial	
1 to 2 months	2 to 5 months
Tractors, Electric Industrial	
4 months	7 months
Trailers, Factory Warehouse	
8 to 12 weeks	16 to 24 weeks
Platform Trucks (Stake Trucks)	
5 months	10 months
Lift Trucks, Electric (Platform)	
1 to 5 months	6 to 10 months
Fork Truck, 2,000# cap.	
1 month	3 months
Fork Truck, 4,000# cap.	
5 months	8 months
Fork Truck, 6,000# cap.	
6 months	8 months
Low Lift Platform, 6,000# cap.	
4 months	6 months
Fork, 7,000 to 16,000#	
5 to 7 months	10 to 12 months
Baggage Trucks	
7 months	10 months
Crane Trucks	
1 to 5 months	6 months
Dump Truck, Gasoline	
90 days	90 days
PIPE	
Pipe, Fabricated	
1 month	Carload, 3 to 4 mo. LCL, 6 to 8 weeks
PIPING	
Exhaust and Blow	
— —	1 to 3 months
Steel, Welded, Riveted	
3 months	Indefinite
Prefabricated Piping	
Indefinite	
PLASTICS	
Molds; begin deliveries	14 to 16 weeks
PUMPS	
Centrifugal	
3 to 15 weeks	8 to 24 weeks
Dry Vacuum to 105 cf	
Stock to 2 months	— —
200 to 700 cu. ft.	
3 to 5 months	— —
Liquid Pumps	
1 to 3 months	3 to 6 months
Turbine	
Stock to 4 weeks	6 to 24 weeks
RETAINING RINGS	
Stock to 3 weeks	12 to 14 weeks
RUBBER PRODUCTS	
Coated Fabrics	
2 weeks	6 weeks
Extrusions	
1 week	3 weeks
SCALES	
Platform, Portable	
Stock to 2 months	6 to 12 months

Standard Products	Special Order
Truck	
3 to 6 months	6 to 11 months
Platform Dormant	
Stock to 4 months	4 to 8 months
Crane	
Stock to 4 months	6 months
Counting, Portable & Bench	
Stock to 4 months	46 months
Automatic Batching	
— —	12 months
Miscl. Industrial Types	
8 months	10 months
Automatic Dial Scales	
3 to 8 months	10 to 14 months
SCREW MACHINE PRODUCTS	
Brass, Aluminum, Steel	
— —	2 to 3 weeks
SPRINGS	
Extension, Compression, Torsion	
2 to 4 weeks	1 to 8 weeks
Spring Stampings	
— —	90 to 150 days
Flat Springs and Small Wire Forms	
6 to 8 weeks	1 week to 4 months
STAMPINGS	
Small Metal	
2 to 3 months	1 to 2 months
Specialties, Pressed Metal	
— —	3 months
STEEL	
"On a quarterly quota basis"	
STEAM CLEANERS	
3 weeks	6 weeks
SPEED REDUCERS	
4 to 6 weeks	10 weeks
SPROCKETS	
Stock	2 to 4 weeks
Cut Tooth Steel	
6 to 12 months	— —
Cut Tooth Cast Iron	
8 to 15 months	— —
Roller Chain	
1 to 4 weeks	6 to 12 weeks
Silent Chain	
1 to 4 weeks	6 to 12 weeks
TANKS	
1 week	4 weeks
TAPES	
Electric	
Stock to 2 weeks	4 to 6 weeks
Cloth Back	
Stock to 2 weeks	4 to 6 weeks
TEXTILE EQUIPMENT	
12 months	18 months
Textile Finishing Equipment	
12 months	16 months
TOOLS	
Broaches, Keyway	
Stock	3 to 4 weeks
Counterbores	
Stock	3 to 4 weeks
Dies	
Stock	3 to 4 weeks
Drills	
Stock	— —
Taps	
Stock	3 to 4 weeks
Steel Marking	
1 to 3 weeks	1 to 5 weeks
Twist Drills	
1 to 2 weeks	3 to 4 weeks
Reamers	
1 to 3 weeks	4 to 5 weeks
TRANSMISSION	
Belting	
4 weeks	— —
Clutches	
Stock to 5 weeks	— —
Indexing Clutches	
3 to 6 weeks	6 to 10 weeks
Friction Clutches	
Stock to 4 months	1 to 4 months

Standard Products	Special Order
Couplings	
Stock to 2 weeks	3 to 4 weeks
Flexible Chain Couplings	
3 to 4 weeks	6 to 8 weeks
Collars	
Stock to 2 weeks	3 to 4 weeks
Pulleys, Steel	
2 months	3 months
Pulleys, Cast Iron	
Stock to 30 days	2 to 5 months
Pulleys, Wood	
1 month	2 months
Pillow Blocks	
Stock to 2 weeks	3 to 4 weeks
Motor Bases	
1 month	2 months
Shaft Collars	
1 month	2 months
1⅝ to 3¼ A&B Groove Sheaves	
Immediate	— —
Spl. Steel Sheaves to 5¼	
— —	30 days
Sheaves, Cast Iron	
1 month	2 months
Sheaves, Steel	
1 month	2 months
V-Belt Sheaves	
Stock to 30 days	60 to 90 days
Speed Reduction Units	
1 month	3 months
TUBING	
Steel—Monel—Nickel	
2 to 4 weeks	3 to 5 weeks
Aluminum	
4 weeks	— —
Alloy	
4 to 6 weeks	— —
Stainless Seamless and Welded Tubes	
2 months	4 months
Seamless, Hot Finished	
8 months	— —
Seamless, Cold Drawn	
6 months	— —
Boiler Tubes	
3 to 4 months	— —
TUMBLING BARRELS	
1 to 2 months	Indefinite
VALVES	
Bronze, Threaded	
Stock to 60 days	45 to 90 days
Valves, Iron	
Stock to 60 days	2 to 3 months
Valves, Steel	
Stock to 90 days	2 to 3 months
Valves, General	
Stock to 30 days	60 days
Stainless Steel	
2 to 3 months	120 days and up
WIRE	
Stainless Steel Wire	
4 to 6 weeks	5 to 6 months
Carbon Steel Wire	
3 weeks to 5 months	1 to 7 months
Chain Link Fence	
4 to 5 months	
Gas Welding Wire	
5 to 6 months	
Card Wire	
6 to 8 weeks	10 to 12 weeks
Wire Forms	
— —	3 to 4 months
Iron	
20 weeks	— —
Platinum	
10 weeks	— —
WIRE CLOTH	
Copper, Bronze, Aluminum	
10 months	Beyond 10 months
Standard Hardware Cloth	
3 to 4 months	3 to 4 months
Coarse Industrial Cloth	
1 week to 3 mos.	2 weeks to 3 mos.
Fine Industrial Cloth	
1 to 12 weeks — Some immediate 1 week to 3 months	

TAKING INVENTORY 1948 STYLE

●

Use of modern equipment speeds up stock tally from 400 items per day to 400 items per hour

R. K. Ropp taking stock inventory with the aid of microphone and wire recorder.

Inventory count is transcribed to master sheet by Mrs. Margaret McEachern from the wire recording.

SUBSTANTIAL savings in time and manpower have been effected by Navy Supply Corps personnel through the use of magnetic wire recorders for taking stock inventories. And along with these savings, the possibilities of error through misunderstanding and in transcription have been reduced to a minimum. The method is equally adapted to inventory checking in any business or industrial organization.

The conventional system of taking inventories has been to have a team of two men go through the stockroom, the checker calling off the items and quantities to the recorder, who manually enters the count on inventory sheets as he calls the items back to the checker. In the event of a misunderstanding, or a transposition of stock numbers, the only recourse is a time-consuming recheck of the shelves and a duplication of work already done once.

The new system, originated at the Supply Department of the Naval Shipyard at Norfolk, Virginia, requires only one checker who carries a hand microphone along as he inventories shelves and bins, reading his count into a permanent record for later transcription under conditions far more conducive to accuracy. The only rechecking required under these circumstances is to "play back" the wire record for the item in question.

Time studies at Norfolk showed that checkers were counting and recording 100 items in 15 minutes of recorded time. This compares with previous figures of about 400 items per day using a two-man team.

MAINTENANCE SURVEYS GUIDE PURCHASING

Reviewing a Maintenance Report as the basis for determining a course of action with a vendor are (left to right): Howard J. Fox, representing Maintenance; E. W. Fuller, representing Engineering; and E. Hotvedt, representing Purchasing.

● ***By Joseph Albin***

Satisfactory service and hidden inventory expenses are revealed to American Airlines buyers through a complete record of performance, failures and costs on individually identified units of equipment, based on data drawn from field maintenance reports

FROM the time a specifically identified piece of equipment is put into service on Amercan Airlines until the time it is scrapped, a log or record is kept of its maintenance cost and service life. The activity would seem to demand great amounts of controlled patience and filing space. But like the census, it is the summarizations from a great many bits of individualized information that have the impress of massiveness.

The maintenance record division in the La Guardia Field offices has developed a technique of keeping logs of aircraft equipment that need to be serviced, repaired or replaced, and transported to and from depots with greater frequency than is the case with other items. An important fact from the viewpoint of Purchasing is that while this class of equipment is in transit, it needs to be backed up by additional inventory. As will be noted in this article, the surveys have led to the more efficient use of stored material.

Over a period of recent years, it has been the experience of the company that the savings in inventory and the valuable information gained about performance and cost, more than matched overhead and clerical labor costs of the surveys. Of foremost gain is the guidance afforded Engineering and Purchasing on placing of future orders, other factors being equal such as price and specification fulfillment. The information places Purchasing in a stronger bargaining position to secure warranties. Vendors have come to look forward to the semi-annual summaries to learn about the service life of their products.

In choosing among several maintenance department surveys to help elucidate procedures and applications, it was felt that the selection of tires would have a general appeal. Inventory, storing, shipping, repair and an amount of related technical data about tires pretty well come within the ken of purchasing agents in many fields. The survey on the DC-3 tire happens to be especially interesting in view of the action taken on vendors based on information supplied in the

Primary source of service data is the report of the field maintenance crew man, whose first job is to check difficulties mentioned by the pilot in his flight report.

Exhibit 1

Tire Life & Cost Summary (1700 X 16) 1943 through 1946

Manufacturer	Second Half 1946		First Half 1946		Second Half 1945		First Half 1945		Second Half 1944		First Half 1944		Second Half 1943		First Half 1943	
	Avg. Time	Cost per Hour	Avg. Time	Cost per Hour	Avg. Time	Cost per Hour	Avg. Time	Cost per Hour	Avg. Time	Cost per Hour	Avg. Time	Cost per Hour	Avg. Time	Cost per Hour	Avg. Time	Cost per Hour
A	1570 (36)	9.38¢	1395 (28)	10.57¢	1428 (14)	10.24¢	1726 (15)	8.85¢	1577 (27)	9.52¢	1131 (6)	8.10¢	806 (2)	11.54¢	1411 (5)	7.37¢
B	1158 (135)	10.41¢	1122 (116)	10.51¢	1085 (71)	11.32¢	896 (60)	11.96¢	884 (136)	12.50¢	783 (50)	14.47¢	851 (127)	14.69¢	960 (171)	13.93¢
C	1191 (10)	11.31¢	1109 (40)	10.89¢	1112 (81)	10.01¢	1200 (54)	9.74¢	1128 (15)	10.05¢	980 (13)	11.04¢	1165 (15)	6.20¢	1476 (10)	5.65¢
D	686 (22)	15.40¢	721 (42)	14.25¢	714 (23)	14.85¢	559 (11)	16.22¢	487 (5)	11.06¢	512 (114)	19.67¢	981 (6)	9.48¢	—	—

Note: Figures in parenthesis under "Average Time" column denote number of tires scrapped and on which averages are based.

survey. Exhibits on these pages include detailed portions of this survey.

The survey on the DC-3 Tire Cost and Service was begun January 1943 and was continued through 1946. It was discontinued due to plan of sale of DC-3 aircraft. There are three tires on the DC-3 plane; two landing wheel tires and a smaller 900 x 6, 8 ply tail wheel tire. The survey figures given here are on the 1700 x 16, 10 ply landing wheel tires, which are supplied by four manufacturers denoted here as "A", "B", "C", and "D".

Referring to Exhibit 1, there is given here the semi-annual summaries through the above stated period according to manufacturers. It can readily be seen that the whole story is boiled down to present just two facts: the total service life and the total hourly cost per tire. Service life is the "Average Time" for the specific number of tires scrapped. Cost per hour is the cost of landing per hour. How many landings make an hour? One travel hour is consumed making one landing of the DC-3. This figure has been arrived at by a study of representative schedules, based on pilots' reports.

The purchase price of tires is the same from each of the four manufacturers or vendors; cost of retreading is the same. Each of the manufacturers presents a tire that meets Engineering specifications and tests. Thus on the basis of cost and preservice compliance, Purchasing might choose to allocate orders for the DC-3 tires equally among the four vendors. However, on the basis of the information supplied in this exhibit, Purchasing changed its system of allocation when the time came to place an order. Vendor "A" received the largest portion; "B" and "C" were allotted smaller portions; and it did not appear worth while to allocate any part of the order to "D", which shows itself consistently at the bottom of the list.

The preference for the revised allocation of orders was not based on purely arithmetical calculation of averages. As this chart is examined

Exhibit 2

Casings Retired from Service
Manufacturer A
January 1, 1946 to June 30, 1946

Size of Tire	1700 X 16 (10 Ply)
Equipment Used on	DC-3 and DC-3A
ORIGINAL TREAD	
Number of Casings Scrapped	28
Total Flying Time (Original)	16,085
Average Flying Time per Casing	574
Cost of Tires (New)	$2,375.80
Cost of Repairs to Original Tread	$ 10.50
Total Cost of Tires	$2,386.30
Cost per Hour per Casing (in cents)	14.83¢
FIRST RETREAD	
Number of Casings Retreaded	24
Total Flying Time (1st Retread)	11,571
Average Flying Time per Casing	482
Cost of First Retread	$ 816.00
Cost of Repairs to First Retread	$ 13.61
Total Cost of First Retread	$ 829.61
Cost per Hour per Casing (in cents)	7.17¢
SECOND RETREAD	
Number of Casings Retreaded	20
Total Flying Time (2nd Retread)	10,403
Average Flying Time per Casing	520
Cost of Second Retread	$ 646.00
Cost of Repairs to Second Retread	0.00
Total Cost of Second Retread	$ 646.00
Cost per Hour per Casing (in cents)	6.21¢
GRAND TOTALS	
Number of Casings Scrapped	28
Total Flying Hours	38,059
Average Flying Time per Casing	1,359
Cost of Casings	$3,861.91
Credits Received	$ 34.00
Net Cost of Casings	$3,827.91
Cost per Hour per Casing (in cents)	10.57¢

Note: A similar report is kept on casings of each of the other manufacturers.

from the first half of 1943 on to the end of 1946, trends in the cost per hour may be observed. Except in the case of manufacturer "D", there is an overall downward swing in this figure as it applies to the other manufacturers. A possible interpretation is that there is evident improvement in tire materials or fabrication in the cases of manufacturers having the favorable cost per hour tires. But this conjecture needs to be analyzed in the light of detailed data as it pertains to each of the suppliers (Exhibits 2 and 3). These constitute the summary covering the period of January 1, 1946 to June 30, 1946, for one manufacturer's tires, and may be regarded as typical of other summaries.

Here is given for the individual manufacturer data regarding his tires, such as flying time, cost, repair and retreading costs, and calculating cost per hour per casing. There is also a tabulation showing reasons for scrapping casings, which is indicative of the degree of comprehensiveness of this survey. Manufacturer "A" tires were scrapped chiefly because his tires had the maximum number of retreads permitted. In the case of manufacturer "B", scrapping of his tires largely developed because of condition of treads, the receiving of cuts and bruises. The tires of manufacturer "C" succumbed mostly to tread cuts and crown cuts. In the case of "D", the majority of tires were scrapped because of radial cracking. None of the tires of the other manufacturers were rendered inoperative because of rupture by landing impact with an object. A review therefore of this data ought to make more understandable the decision of the Airlines' purchasing department to favor "A" with the major part of new orders for DC-3 tires and to hold up ordering from "D". The test of actual service placed a finger on structural differences.

Exhibit 3

Reasons for Scrapping Tires

	Mfr. A		Mfg. B		Mfg. C		Mfg. D	
	No.	%	No.	%	No.	%	No.	%
Maximum Number of Retreads Permitted	15	53.58	13	11.22	2	5.00	2	4.76
Tread Cuts	5	17.86	20	17.24	10	25.00	3	7.15
Three-inch Carcass Break	4	14.28	—	—	—	—	—	—
Blown Out on Landing	1	3.57	—	—	—	—	3	7.15
Skidded Through	1	3.57	—	—	—	—	—	—
Damaged Sidewall	1	3.57	1	.86	—	—	1	2.38
Internal Break	1	3.57	—	—	—	—	—	—
Tread Bruises	—	—	7	6.04	—	—	—	—
Rupture from Bead to Bead	—	—	1	.86	—	—	1	2.38
Tread Cuts and Bruises	—	—	47	40.52	—	—	—	—
Tread Cuts and Weather Checks	—	—	2	1.72	—	—	—	—
Tread Bruises Flat Spot	—	—	4	3.45	1	2.50	1	2.38
Tread Cuts Shoulder Bruises	—	—	2	1.72	1	2.50	—	—
Cut through Cord Body and Plies	—	—	3	2.59	—	—	2	4.76
Tread Cuts and Crown Wear	—	—	7	6.03	—	—	—	—
Tread Cut Run Flat	—	—	1	.86	—	—	—	—
Heavy Tread Splice	—	—	1	.86	—	—	—	—
Tread Cuts Flat Spot	—	—	5	4.31	—	—	—	—
Ply Separation	—	—	1	.86	2	5.00	1	2.38
Sidewall Snag Flat Spot	—	—	1	.86	—	—	—	—
Crown Cuts	—	—	—	—	11	27.50	2	4.76
Worn through All Plies	—	—	—	—	5	12.50	—	—
Open Sidewall Splice	—	—	—	—	1	2.50	2	4.76
Failed during Curing Process	—	—	—	—	6	15.00	3	7.15
Open Tread Splice Oil Soaked	—	—	—	—	1	2.50	—	—
Radial Cracking	—	—	—	—	—	—	15	35.72
Large Diagonal Crown Rupture	—	—	—	—	—	—	2	4.76
Five-inch X-Type Landing Rupture	—	—	—	—	—	—	1	2.38
Separation in Walls	—	—	—	—	—	—	1	2.38
Defective Factory Repair	—	—	—	—	—	—	1	2.38
TOTAL	28	100%	116	100%	40	100%	42	100%

Note: In practice, these tabulations are not correlated in a comparative table, but separate lists for each manufacturer are attached to the report of casings retired from service (Exhibit 2).

Data on which the foregoing summaries are based were taken from the "Tire Log". This filing card form measures 8 x 5 inches, and has printed all necessary notation, with serial number prominently shown at upper right. The same printing appears on the opposite side. The lower part of the card has provisions for compiling summary of service. Data derived from a group of "Tire Logs" of tires scrapped during a six month period constitute the grand semi-annual summary.

Other items under study, such as batteries, engines, de-icing boots, etc., have service life and cost data entered on a similar card, known as the "Equipment Log".

Entries from these records are derived from the original reports made by pilots on every flight. Each pilot is required to make out both a Flight Report and a Maintenance Report. This is a double form, perforated for separation and punched for filing in a post binder. The former shows flying time, gasoline and oil consumption, and is correlated with the time since the last engine overhaul, oil change, and other standard maintenance operations. The Maintenance Report indicates any difficulties that have been noted during the flight, including mechanical problems that should receive immediate attention by the field maintenance men. This latter report is subject to scrutiny by the field maintenance personnel directly after the plane has landed, and on the reverse side in a Maintenance Report on which they note both their own inspections and a listing of work done to correct difficulties reported by the pilot, or the reasons why they were not corrected. Serial number and other identification of parts repaired or replaced are noted on this report. From this record, the maintenance office clerks post the information on tire and equipment logs.

Efficient Use of Inventory

Besides guiding Purchasing in the selection of vendors on the basis of service life and hourly cost figures, the maintenance surveys are a source of information regarding inventory expenses. From the data carried on the logs, calculations have been made of the additional inventory required to back up tires in transit, the tires requiring retreading and repair.

American Airlines is a far-flung transportation system having thirty depots where there is shipping of tires and storing. In the final cost of tires there needs to be included: shipping expense, capital investment, and overhead for storage space. As

newer fleets are being added to the system, the tires are heavier and more in number per ship, as in the case of the DC-4s and DC-6s. The inventory aspect begins to require extra study for purpose of reducing tire maintenance cost.

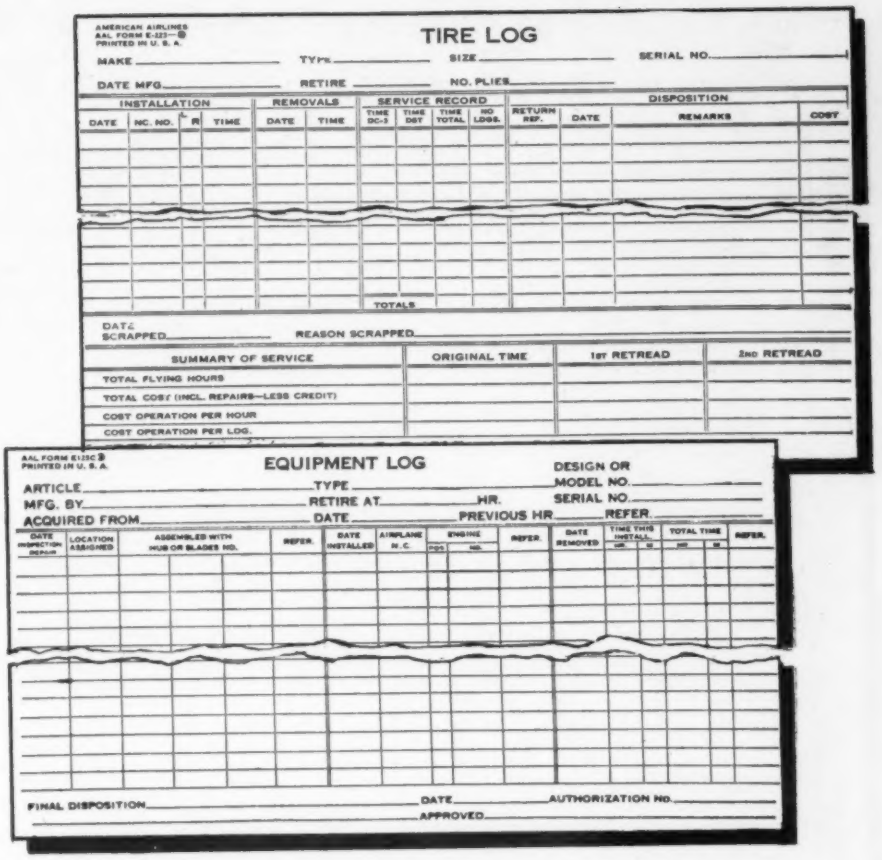
The solution sought is expressed rather simply: How to shorten transit time. If you are able to cut down the amount of time in shipping new tires, tires in the 1st retread category, tires in the 2nd retread category, and tires for repair, you can make a fewer number of tires serve the system. Having fewer tires, and a greater index of active use per tire, results in lowering the number of tires that need to be kept as insurance to meet the problem of deterioration of rubber. It adds up to this: Rapid turnover and use avoids deterioration losses.

The first solution adopted was to have replacements supplied by one manufacturer at several different localities along the A.A. system; by another manufacturer at another set of localities. Also, arrangements have been made to use local retreading facilities of the manufacturer, and to have him ship from his stock of tires as they are requested by the depots. In this way the company gained an amount of improved service from the manufacturers' product. Shipping expenses are less, and available storage space adequate. Studies are continuing to even further reduce overall aircraft tire costs.

Arriving at a workable analysis and effective solution occurred at conferences between representatives of maintenance, engineering and purchasing departments.

American Airlines began to keep some service life records at the time of its inception. In 1940—the year in which Howard J. Fox took over his position of office manager of the maintenance division—the service life of aircraft batteries was felt to be low and consequently high in cost. The practice was to have all batteries removed from planes in the system to be shipped to the New York battery shop. Mr. Fox started to have logs kept for individual batteries, on which was noted the cause of trouble each time that the battery was sent to the manufacturer for major repair work. By close cooperation with the manufacturer, keeping him posted on service being derived from each battery, a point was reached where a positive advance in battery service life developed, and fewer claims were presented by the airline for below-standard complaint.

In 1946, a survey was commenced


AMERICAN AIRLINES
A.A.L. FORM E-123—D
PRINTED IN U. S. A.

TIRE LOG

MAKE _____ TYPE _____ SIZE _____ SERIAL NO. _____

DATE MFG. _____ RETIRE _____ NO. PLIES _____

INSTALLATION				REMOVALS		SERVICE RECORD				DISPOSITION			
DATE	NO. NO.	R	TIME	DATE	TIME	TIME DC-3	TIME DST	TIME TOTAL	NO LDGS.	RETURN REP.	DATE	REMARKS	COST
						TOTALS							

DATE SCRAPPED _____ REASON SCRAPPED _____

SUMMARY OF SERVICE	ORIGINAL TIME	1ST RETREAD	2ND RETREAD
TOTAL FLYING HOURS			
TOTAL COST (INCL. REPAIRS—LESS CREDIT)			
COST OPERATION PER HOUR			
COST OPERATION PER LDG.			

AAL FORM E-125C
PRINTED IN U. S. A.

EQUIPMENT LOG

ARTICLE _____ TYPE _____ DESIGN OR MODEL NO. _____

MFG. BY _____ RETIRE AT _____ HR. SERIAL NO. _____

ACQUIRED FROM _____ DATE _____ PREVIOUS HR. _____ REFER _____

DATE INSPECTION DEPOT	LOCATION ASSIGNED	ASSEMBLED WITH HUB OR BLADES NO.	REFER.	DATE INSTALLED	AIRPLANE N. C.	ENGINE POS.	ENGINE NO.	REFER.	DATE REMOVED	TIME THIS INSTALL. HR.	TIME THIS INSTALL. M	TOTAL TIME HR.	TOTAL TIME M	REFER.

FINAL DISPOSITION _____ DATE _____ AUTHORIZATION NO. _____

APPROVED _____

Complete service records, including cost of repairs and net cost per hour of operation, are kept from the time equipment is put into operation until it is retired from service.

to study the factor of shipping on battery inventory. Batteries are a heavy, bulky commodity, and incidentally, are not shipped by airplane. Shipping costs on batteries for one specific type airplane amounted to $1865.22, which is approximately the value of one month's battery consumption, about 72 batteries a month. Thus, money spent for transportation over a period of a year equalled money to acquire one month's supply of batteries. But the important fact, as in the case of the tires, was that all the time the batteries were in transit it was necessary to have other batteries in inventory to take their place.

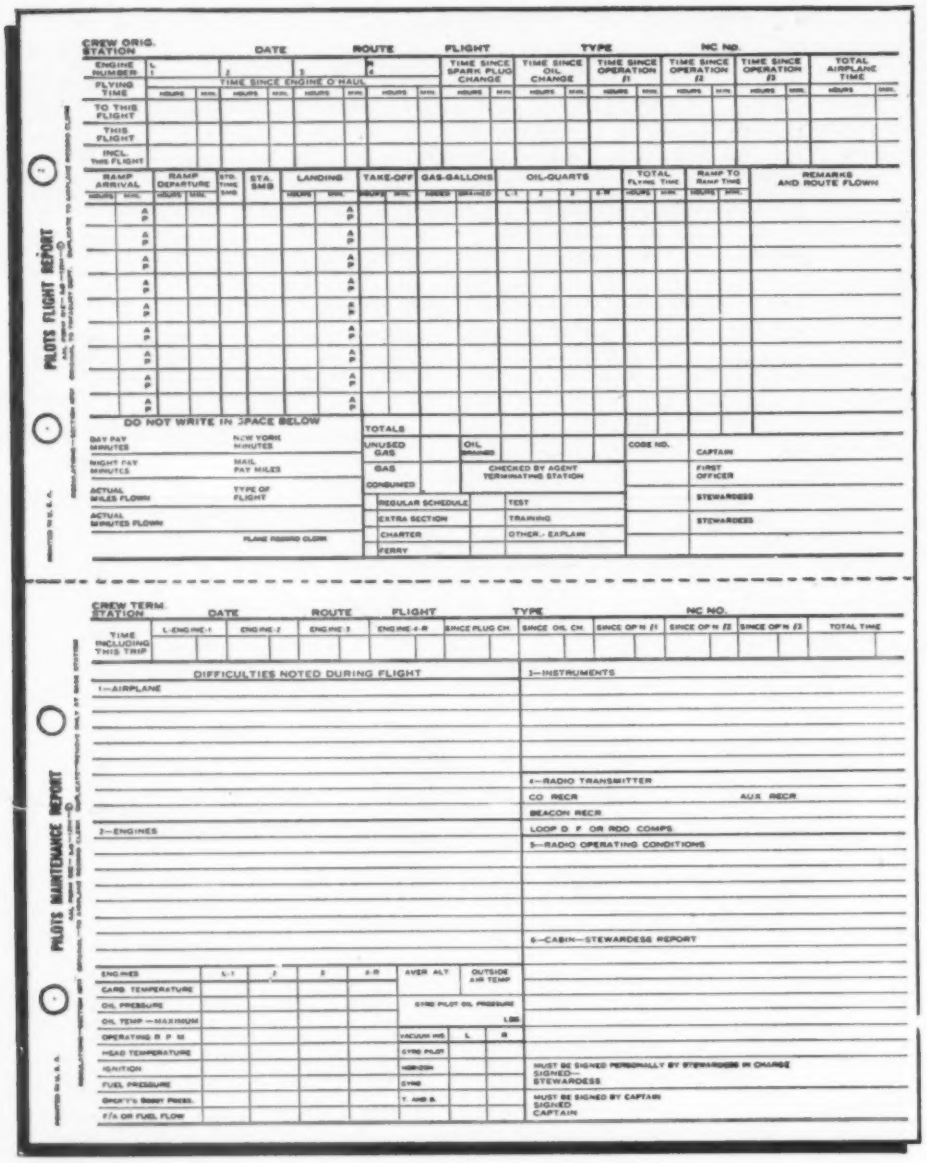
The solution adopted to eliminate excess inventory due to transit time, was to establish battery repair and replacement points throughout the system, using manufacturer's facilities where available.

"Wherever possible, we have initiated only those records which we feel will more than pay for themselves," Mr. Fox explained. "This is accomplished by providing the data necessary to work with Engineering and Purchasing and the vendor towards improved service, lower maintenance costs and more expeditious handling of inventory.

"The biggest problem deals with repairable parts. In our type of organization and its breadth of activities, you find yourself in the position whereby parts must be handled and shipped many times, and in many cases for long distances. From the time the part is first removed from the aircraft to the time it is repaired by the manufacturer and returned to our inventory, it is the basis of much cost.

"There is, first, manpower to remove the part; next, the stores problem, packing and shipping, and transportation costs. The usual practice is to have the parts shipped from the depots to a central location of American Airlines, as New York, where it may be decided to return it to the manufacturer. Reshipping, receiving and inspection chores are repeated. Much money is spent in addition to repair. Now comes the $64 question: Is the money and effort spent in all this handling worth having the part repaired? Or is it better to throw the part away at point of removal? A compromise solution would be to work with the manufacturer to see how he can cooperate to eliminate some of the costs by local handling."

After all, manufacturers and suppliers do not know your problem until you talk to them about it, and a



PILOTS FLIGHT REPORT

CREW ORIG. STATION | DATE | ROUTE | FLIGHT | TYPE | NC NO.

ENGINE NUMBER | TIME SINCE SPARK PLUG CHANGE | TIME SINCE OIL CHANGE | TIME SINCE OPERATION #1 | TIME SINCE OPERATION #2 | TIME SINCE OPERATION #3 | TOTAL AIRPLANE TIME

FLYING TIME — TIME SINCE ENGINE O'HAUL — TO THIS FLIGHT — THIS FLIGHT — INCL. THIS FLIGHT

RAMP ARRIVAL | RAMP DEPARTURE | STD. TIME SAVED | STA. SAVED | LANDING | TAKE-OFF | GAS-GALLONS | OIL-QUARTS | TOTAL FLYING TIME | RAMP TO RAMP TIME | REMARKS AND ROUTE FLOWN

DO NOT WRITE IN SPACE BELOW

DAY PAY MINUTES | NEW YORK MINUTES | NIGHT PAY MINUTES | MAIL PAY MILES | ACTUAL MILES FLOWN | TYPE OF FLIGHT | ACTUAL MINUTES FLOWN | PLANE PROVED CLEAN

TOTALS | UNUSED GAS | GAS CONSUMED | OIL | CHECKED BY AGENT TERMINATING STATION

REGULAR SCHEDULE | EXTRA SECTION | CHARTER | FERRY | TEST | TRAINING | OTHER - EXPLAIN

CODE NO. | CAPTAIN | FIRST OFFICER | STEWARDESS | STEWARDESS

PILOTS MAINTENANCE REPORT

CREW TERM. STATION | DATE | ROUTE | FLIGHT | TYPE | NC NO.

TIME INCLUDING THIS TRIP | L ENGINE 1 | ENGINE 2 | ENGINE 3 | ENGINE 4 | SINCE PLUG CH. | SINCE OIL CH. | SINCE OP'N #1 | SINCE OP'N #2 | SINCE OP'N #3 | TOTAL TIME

DIFFICULTIES NOTED DURING FLIGHT

1—AIRPLANE

2—ENGINES

3—INSTRUMENTS

4—RADIO TRANSMITTER — CO. RECR. — AUX. RECR. — BEACON RECR. — LOOP D. F. OR RDO COMPS.

5—RADIO OPERATING CONDITIONS

6—CABIN—STEWARDESS REPORT

ENGINES | L-1 | 2 | 3 | 4-R | AVER ALT. | OUTSIDE AIR TEMP.

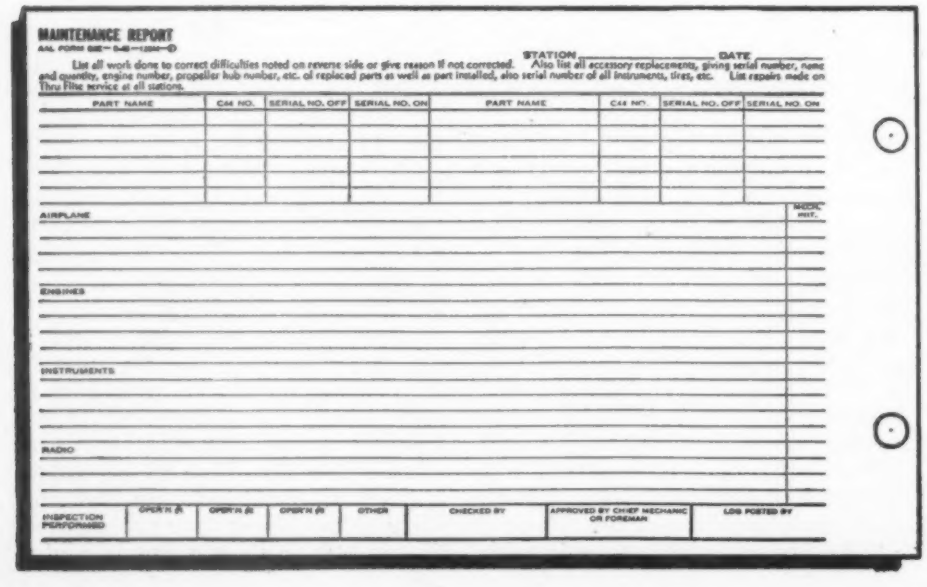
CARB. TEMPERATURE | OIL PRESSURE | OIL TEMP.—MAXIMUM | OPERATING R.P.M. | HEAD TEMPERATURE | IGNITION | FUEL PRESSURE | SPERRY'S BOOST PRESS. | F/A OR FUEL FLOW

SYNC PILOT OIL PRESSURE — LBS. — VACUUM INS. L R — SYNC PILOT — HORIZON — GYRO — T. AND B.

MUST BE SIGNED PERSONALLY BY STEWARDESS IN CHARGE — SIGNED— STEWARDESS

MUST BE SIGNED BY CAPTAIN — SIGNED CAPTAIN

The pilot reports after each flight, showing needed maintenance to be done by the field crew. Maintenance Report on the reverse side of pilot's report is the basis for complete service records.



MAINTENANCE REPORT

AAL FORM 532—540—(12M)—©

STATION _____ DATE _____

List all work done to correct difficulties noted on reverse side or give reason if not corrected. Also list all accessory replacements, giving serial number, name and quantity, engine number, propeller hub number, etc. of replaced parts as well as part installed, also serial number of all instruments, tires, etc. List repairs made on Thru Flite service at all stations.

PART NAME | CAA NO. | SERIAL NO. OFF | SERIAL NO. ON | PART NAME | CAA NO. | SERIAL NO. OFF | SERIAL NO. ON

AIRPLANE — MAINT. INST.

ENGINES

INSTRUMENTS

RADIO

INSPECTION PERFORMED | OPER'N #1 | OPER'N #2 | OPER'N #3 | OTHER | CHECKED BY | APPROVED BY CHIEF MECHANIC OR FOREMAN | LOG POSTED BY

sure way to invite their interest is to talk about the service life of their products. Mr. Fox's records have the persuasion of thoroughness, and he relates them capably to the problems of purchasing.

Overall Purchase Picture

The broad aspects of the problems of purchasing in a widely ramified organization as American Airlines is the province of G. J. Brandewiede, Director of Materials, of which Purchasing is a division. He considers it a central obective to bring about a thorough and systematic relationship between his department and the group of design engineers, service, maintenance, and stock personnel. Having achieved that structural harmony, his department representatives approach suppliers equipped with an expert knowledge of past experience on any particular line of products needed. Price can be more equitably and more understandably determined.

It is advantageous to bring to engineers and other personnel making purchasing requests the whole purchase picture, and not merely to the procurement function. The lowest cost in the long run is the resultant combination of factors. These may be enumerated as—

(a) satisfaction of flight safety requirements
(b) inventory
(c) maintenance costs
(d) commitments of engineers to suppliers
(e) careful service and maintenance records.

The last mentioned item, as exemplified by the survey in this article, contributes to the gaining of more liberal warranties and lower prices. They tend also to lead to product improvement on the part of the supplier, so as to give longer service and lower maintenance cost.

Mr. Brandewiede joined American Airlines in 1947, after having been associated over many years with Curtis Wright. He dates his connection with aviation to the early twenties.

Maintenance reports have special value for Purchasing when plans are made by American Airlines for the acquisition of a new fleet. The reports indicate the extent that the strategic location of supply points by the vendor would help in lowering shipping costs, and from this point of view serve as a criterion for the selection of vendors. Surveys are being inaugurated for such replaceable items as spark plugs for which considerable outlays of money are anticipated each year.

SCIENCE AND THE LAYMAN

How much do you know about what is going on in the research laboratories?

The scientific laboratory is the pilot plant for human progress; the responsibilities of intelligent citizenship demand that we understand the process and direction of research

●

By Grey Leslie

THOMAS H. HUXLEY'S basic definition of science as being nothing more than 'organized common sense" will appeal to purchasing agents, and to businessmen generally, who have not had special scientific or technical training. Nevertheless these same executives are being called upon, more and more, to pass judgment on scientific and technical matters of vital importance to the organizations they work for and to their own interests. Since research in science and technology is now almost as much a part of industry as purchasing, manufacturing and selling, it becomes necessary for business and industrial executives, at all levels, to develop what an outstanding American scientist calls, "a feeling for research and scientific development work, which will enable them to understand quickly a proposed line of attack and evaluate the chances of success."

The atom tempo has popularized scientific shop-talk in daily business and social conversation. People nowadays toss around words like 'chain-reaction', 'neutron', 'fission', 'supersonic' with an easy familiarity; but it is doubtful if any but a select few have even a basic idea of their scientific meaning, their development, and their association, beyond fragmentary or fictionalized segments.

It may be surprising, and perhaps a bit of a shock to our exalted estimate of 20th Century enlightenment, to learn that the average non-scientific reader of the 18th Century had a far greater grasp of the full meaning and significance of the sciences of his time than a person in similar circumstances today. A typical 18th Century English magazine, bearing the picturesque title, "The Ladies" and Gentlemen's Diary and Women's Almanac," regularly carried articles on profound topics, by eminent scientists like John Dalton, who first adopted the word 'atom' in his "Inquiry into the Ultimate Particles of Bodies." Merchants, statesmen, writers, retired gentlemen, housewives, in fact all educated laymen of that time, learned about science and scientific thinking through their popular magazines and books. Poets enshrined the Newtonian principles of optics and mechanics in their poetry, even using exact Newtonian terms.

British, French, German, Dutch and Italian publishers all stressed publications and articles on scientific subjects written in the layman's language of the day. Leonard Euhler's "Letters To A German Princess" was in reality a scientific primer for laymen, and was reprinted thirty-five times in nine languages. Voltaire used his "Elements of Sir Isaac Newton's Philosophy" as a vehicle to exercise his gift for lucid scientific exposition. Fontenelle's "Conversations on the Plurality of Worlds" explained Copernican astronomy against a delightful setting of moon-lit gardens and enchanting arbors. In England, Henry Pemberton published his "View of Sir Isaac Newton's Philosophy", a book that prompted a generous testimonial from Jonathan Edwards, because the author showed "the simple and genuine products of the philosopher disengaged from the problems of the geometrician."

In our time, an article on science, it seems, must be so specialized, so technical, so highly compartmentalized, or so baldly fictionalized, that the average reader can only hope to get a rather formal and frequently discouraging introduction to unconnected scientific achievements. Among the more common sources of such technical information are the "popular" articles dealing with the development of useful and tangible end-products susceptible to glamorized advertising. Nylon, plastics, DDT and sulfa-drugs are but a few examples. Because of the piecemeal nature of such presentations and their emphasis on the glamorous aspects of the achievement, the non-technical reader is likely to gather the totally erroneous impression that scientific discovery is frequently made by sheer inspiration or good luck—a miracle or a message from the blue. There are rare exceptions of this sort, of course, but as a general

rule the real scientific achievement is the result of final co-ordination by trained minds, of accumulated facts and impressions, all integrated into existing and well established principles.

The development of the atomic bomb and the lurid descriptions of the horrific results of its use, quite naturally focussed wide public attention on its scientific background. The stern necessities of war required the utmost secrecy concerning its manufacture while the war was being waged. A great deal of secrecy about its manufacture for military uses must still be maintained in these anxious and uncertain times of trying to make the peace, and the discouraging bickerings about some realistic international control of atomic power for war. Much histrionic nonsense about its peace-time potentialities has been written. But the only use of atomic energy the world has seen so far is the fearful destructive power it possesses. Scientists the world over know how to explode it, and the United States knows how to make it. Beyond that, the layman must deligently search for some basic sensible understanding of what atomic energy might mean in his daily life and in the life of the nation in times of peace.

The Los Alamos anniversary statement, issued by the Federation of American Scientists, contains an observation that has particular significance to all of their non-scientific fellow-men.

"We have learned many valuable lessons during the past two years. We now know that the problem of atomic energy cannot be solved apart from the consideration of other issues."

Hidden in that simple statement is the compelling implication that men must readjust their thinking, in all departments, if the challenge presented by nuclear phenomena is to be met. The first step in any such readjustment is a basic understanding of science itself.

It is reasonable to suppose that if science and skill were allowed to concentrate on the development of atomic energy for constructive rather than destructive purposes, the problems bedeviling the United Nations would assume a very different aspect. The question of the Ruhr, for instance, might lose its political and economic importance. The maneuverings and wranglings over sources of raw materials, electrical energy, manpower, transport, and inland waterways, might be substantially lessened if the world could really put nuclear energy to work. No single event in the history of man would do so much to change the direction of his mind and thought as the thought and knowledge of atomic power as a servant of construction instead of as an agent of death.

The United States today possesses the atom bomb, and cannot surrender it as a weapon until it is internationally controlled. But we might promote and accelerate that control if we energetically pioneered the constructive uses of its power.

It is here that the layman must face his tremendous new responsibility of citizenship. Every American citizen of voting age may soon become, in a very real sense, a lay administrator of science and scientific research. Our law-makers have recognized the urgency of establishing in some form, a National Science Foundation. Expenditures are planned on an unprecedented scale. Public funds will be voted for the support of that scientific research. Since all such monies must come from taxes and be controlled by our elected representatives, the thought, knowledge and action of every man and woman voter must influence the future course of scientific progress in America. Chairman Lillienthal of the United States Atomic Energy Commission said recently in a speech:

"It is fair to say that the entire investment in the atomic energy project—now nearly two and a half billion dollars—may be more than repaid by the benefits to agriculture and to human nutrition alone. Atomic treatment of familiar metals and new knowledge of little known metals open up great prospects in industry. At Commission laboratories, work proceeds, so that some day the energy released by the splitting of the atoms of uranium and plutonium will provide a new source of electricity and heat. New professions for our young people, new hope for the afflicted, new understanding of how science can serve for peace—these are the items on the agenda of the present and immediate future . . . What we should be concerned about, and what we should make sure of, is that the changes shall be fitted into the American way of doing things; that these changes shall not be so imposed upon us that individual freedom is impaired. We must make sure that the American people will have a say-so, and a decisive say-so, in the adjustments these discoveries will bring . . . What this vast problem requires is not technical judgment, but rather the human experience and good sense of the natural leaders of opinion within the thousands of communities of the country. There has never been any good substitute for the all around common sense of an informed lay public. . . . Look upon this task of becoming familiar with the essentials of atomic energy as an obligation. . . ."

This generation has thus an added burden of citizenship in our American democracy. It is one that demands a secure understanding of the history and effect of scientific enterprise. The fascination that even a brief study of atomic energy holds, should not monopolize all the reading time of the layman.

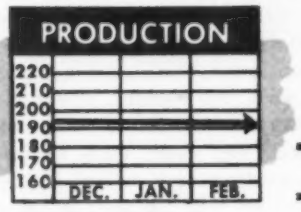
There may be other sources of untapped energy beyond the atom. For example, one can assume, with substantial scientific support, that solar engines can be created even more readily than nuclear power plants—methods of converting solar energy into electrical energy, and capitalizing the chemical effect of sunlight after the manner of a healthy growing tree. It is not even mild speculation to assume, again with substantial scientific support, that new Birminghams, new Chicagos, or new Pittsburghs may have to be created in the United States because of ore depletions or the military necessity for decentralization, or the fact that the sun's radiations cost nothing. The Jules Verne flavor of such assumptions is lessened when it is known that the Massachusetts Institute of Technology has had a research staff operating under a specific fund for solar energy study since 1937.

The layman cannot be expected to be able to make a full synthesis of his casual scientific readings. But his new responsibilities of scientific citizenship demand that he possess a rudimentary knowledge of science so that he may arrive at judgments on broad issues affecting his own and his country's vital interests. Some of these may well include such matters as the proper relation between civilian direction and the military in matters concerning scientific developments; the adequacy of protection against health hazards; the decentralization of cities as a defense measure; the relation of Government monopoly and private competitive production. The mere mention of these few is an indication of the extent of the citizen's interest and his obligation to be informed.

What requirements should be expected of books and articles on science for the layman? Fortunately, a few scientists have come out of the

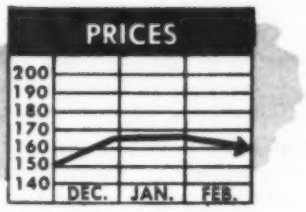
(*Please turn to page* 316)

Where We Stand

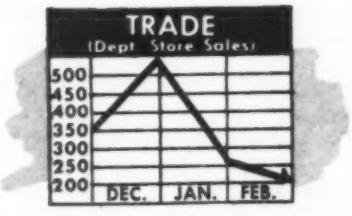


Today's Business Trends As Reported In Current Statistics

	BASE	LATEST	MONTH AGO	YEAR AGO	% OF CHANGE IN MONTH	% OF CHANGE IN YEAR
Industrial Production Index	1935-39=100	191	191	182	—	+ 4.9
Steel Production (Weekly)	000 net tons	1,671	1,723	1,640	— 3.0	+ 1.9
Electric Power Production	mil KWH	5,412	5,228	4,801	+ 3.5	+12.7
Bituminous Coal Production	000 net tons	11,525	11,550	12,300	— 0.2	— 6.3
Auto, Truck & Bus Output	units	80,384	107,837	85,378	—25.4	— 5.8
Petroleum Output	000 bbls	5,333	5,313	4,770	+ 0.4	+11.8
Engineering Construction	000 $	118,995	71,733	83,678	+65.9	+42.8



All Commodities (Bur. Labor Statistics)	1926=100	156.2*	164.4	144.5	— 5.0	+ 8.0
Semi-Manufactured Articles	1926=100	N.A.	157.9	142.1	—	—
Raw Materials	1926=100	179.0*	184.5	154.9	— 2.9	+15.5
Manufactured Products	1926=100	N.A.	156.6	139.7	—	—
Steel Billets, Pittsburgh	ton	$45.00	$45.00	$42.00	—	+ 7.1
Steel Scrap, hvy, Pitts., del.	ton	44.50	44.50	39.50	—	+12.6
Copper (Electrolytic)	lb.	.21 ½	.21 ½	.20 ½	—	+ 5.0
Cotton, mid., 15/16"	lb.	.3330	.3620	.3430	— 8.0	— 2.9
Rubber, (Rib-smoked sheets)	lb.	.20 ½	.21 ⅝	.25 ¾	—	—20.7
Wheat (No. 2)	bu.	2.64 ¾	3.32 ⅝	2.52	—20.4	+ 5.0



*Estimates only, based on PURCHASING's comparisons of daily prices. Bureau of Labor Statistics figures available at the time this chart was prepared would not have reflected wide market fluctuations that occurred last month.

Dept. Store Sales Index (Fed. Res)	1935-39=100	219	251	219	--12.7	—
Commercial Failures (Dun & Bradstreet)	no.	97	58	45	+70.0	+115.0
Freight Carloadings	cars	747,394	831,447	767,301	—10.1	— 2.5

FINANCE

Stock Prices (Standard & Poor's)	1926=100	110.2	121.2	128.1	— 9.1	—14.0
Bank Clearings (Dun & Bradstreet)	mil $	12,455	7,180	9,826	+73.4	+26.6
Federal Reserve Credit	mil $	21,732	22,568	24,638	— 3.7	—11.7
Currency In Circulation	mil $	28,189	28,374	28,346	— 0.6	— 0.5

Materials & Markets

Materials & Markets

AGRICULTURAL COMMODITIES

Following the slump in commodity markets and the subsequent mid-month rally, caution rather than optimism is the attitude generally being taken. At this writing, the recovery appears to be in the nature of a technical adjustment, with a normal rebound in prices resulting from covering by shorts who either wish to take their profit or get out of an overextended short position. Whether the upswing will continue and bring grain prices to previous highs; level off at a point reflecting the natural supply and demand situation in this country and throughout the world; or again reverse itself downward is difficult to predict at the present stage. Market opinion considers the leveling off as the most likely result, but a "wait and see" policy prevails.

Much of the wheat buying during the first substantial rally was attributed in some quarters to the belief that the Marshall Plan would tend to increase exports during the remainder of the crop year. Uncertainty remains, however, as to what definite policy the government will follow during the next few months in regard to its purchases for export. It is estimated that 77,000,000 bushels of wheat remain to be purchased to complete the current wheat export program. Reports that the Western and Southwestern crops in this country had been exposed to high winds following the disappearance of the snow covering also had their effect in boosting prices. Nevertheless, crop reports from other parts of the world, particularly Europe, continued to be good, forecasting a probable drop in demand later in the year.

The general upturn in grain prices was led by corn, the first to break in the original slump and considered by many the key to the whole situation. As with wheat, any intended government support measures have not been made evident up to the present and cannot be definitely considered now in predicting future prices. Both the domestic and foreign supply situations remain favorable.

METALS

Because of adverse weather conditions during the past two months steel production declined slightly, both in ingots and finished products. Continued record demand, and improved wheather, which also brings on a better scrap supply, are expected to push production up again shortly. Basic steel prices remained firm throughout the commodity market slump, and three major producers even raised prices on pipe during that period. Other increases on nails and other products are expected soon.

The aluminum industry continues to operate at capacity, with demand still exceeding supply. Tremendous increases in uses for the light metal have turned about the situation that existed before the war when almost unlimited quantities were available to anyone who needed them. Increases in the prices of fabricated products are expected shortly in the wake of rising scrap aluminum prices that have advanced as much as 30% in the past two months. The dwindling scrap supply offers little hope that present aluminum shortages will disappear this year. Lack of information on Canadian production and export figures has prevented measurement of that country as a source of increased supply.

Conditions in the three leading non-ferrous metal markets — copper, lead and zinc — remained stable as the commodity markets fluctuated. Heavy sales and unsatisfied demands for copper continue, and prices are expected to hold up at present levels, with the possibility of a rise not ruled out. Copper deliveries for January to United States consumers were at the highest level for any month since March last year. Consumer demands remain active for zinc, the price of which jumped late in January, as anticipated. The zinc output in 1947 set a peacetime record. Demand is still high for lead, despite increased production, and prices show no signs of weakening. Stocks of copper, lead and zinc in the hands of producers and smelters are low, representing a few weeks of current consumption.

FUEL

Better weather and continued conservation measures by consumers are aiding in lessening the fuel oil crisis. The supply situation remains tight even though production of distillate oil and crude oil again hit record highs. Spot shortages in motor fuel are anticipated for next summer, as a result of the oil industry's concentration on fuel-oil this winter to the detriment of building up gasoline stocks.

Notwithstanding cold weather, crippled transportation facilities and the freight car shortage, bituminous coal production managed to hold its own. The only ominous note in the coal production picture now is the strategy of John L. Lewis, which has not been made immediately clear.

TEXTILES

Cotton remains in a strong position following a sharp upturn along with other commodities in mid-February. Trade circles feel that lower prices cannot be expected for textiles unless the bottom drops out of the cotton market altogether, and that is not anticipated. Supplies both here and abroad are tight, and demand is still extremely high. Predictions have been made in some textile quarters that higher prices will be asked in the second quarter for sheetings, denims and chambrays. Hopes for a bumper domestic crop this year are not being borne out by initial reports of acreage intentions on the part of farmers.

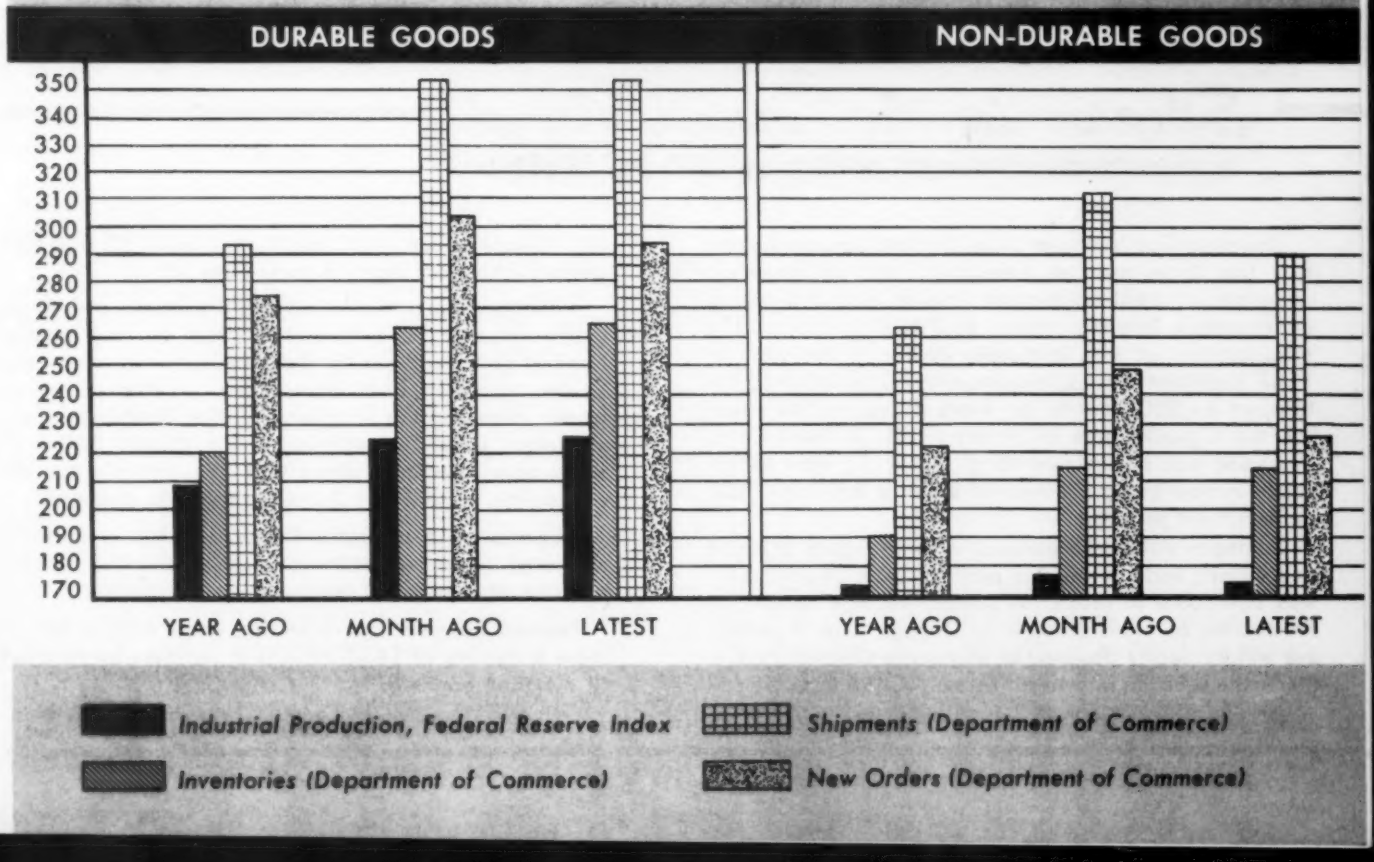
MANUFACTURERS' INVENTORIES, SHIPMENTS AND NEW ORDERS

	1946	1947					
	December	July	August	September	October	November	December
New orders, index, total†.....avg. month 1939 = 100..	241	230	231	257	257	269	252
Durable goods industries.....do.....	270	260	260	287	290	307	291
Iron and steel and their products.....do.....	294	271	285	309	304	347	322
Machinery, including electrical.....do.....	326	328	304		345	349	346
Other durable goods.....do.....	204	194	199	225	232	233	217
Nondurable goods industries.....do.....	223	213	213	238	236	246	228
Shipments, index, total†.....do.....	276	271	282	313	318	328	320
Durable goods industries.....do.....	292	287	301	332	338	351	351
Automobiles and equipment.....do.....	255	264	252	296	301	308	321
Iron and steel and their products.....do.....	232	251	271	294	303	304	295
Machinery, including electrical.....do.....	346	340	351	392	391	412	426
Nonferrous metals and products.....do.....	340	291	311	335	352	396	341
Transportation equipment (exc. autos).....do.....	561	496	497	518	513	568	642
Other durable goods industries.....do.....	271	259	289	316	320	319	323
Nondurable goods industries.....do.....	266	260	269	300	305	312	300
Chemicals and allied products.....do.....	255	252	256	295	296	302	282
Food and kindred products.....do.....	306	292	294	332	338	368	337
Paper and allied products.....do.....	248	250	266	279	287	292	280
Products of petroleum and coal.....do.....	232	263	266	280	280	309	339
Rubber products.....do.....	352	289	300	N.A.	N.A.	N.A.	N.A.
Textile-mill products.....do.....	219	188	205	235	234	231	228
Other nondurable goods industries.....do.....	251	256	271	301	308	286	282
Inventories:							
Index, total.....do.....	204	228	231	234	236	239	238
Durable goods industries.....do.....	220	256	259	263	264	265	267
Automobiles and equipment.....do.....	256	320	327	331	329	322	317
Iron and steel and their products.....do.....	138	157	160	165	164	165	168
Machinery, including electrical†.....do.....	290	341	343	345	350	354	361
Nonferrous metals and products*.....do.....	166	191	191	193	190	184	187
Transportation equipment (exc. autos).....do.....	819	970	990	1019	1017	1031	973
Other durable goods industries†.....do.....	153	171	171	174	177	177	181
Nondurable goods.....do.....	190	204	207	208	211	215	214
Chemicals and allied products.....do.....	195	225	223	219	217	220	232
Food and kindred products.....do.....	202	196	209	214	219	222	216
Paper and allied products.....do.....	185	229	239	245	246	247	251
Petroleum refining.....do.....	133	148	152	157	157	160	156
Rubber products.....do.....	216	272	262	N.A.	N.A.	N.A.	N.A.
Textile-mill products.....do.....	174	186	185	185	185	189	194
Other nondurable goods industries†.....do.....	208	222	218	217	226	232	224

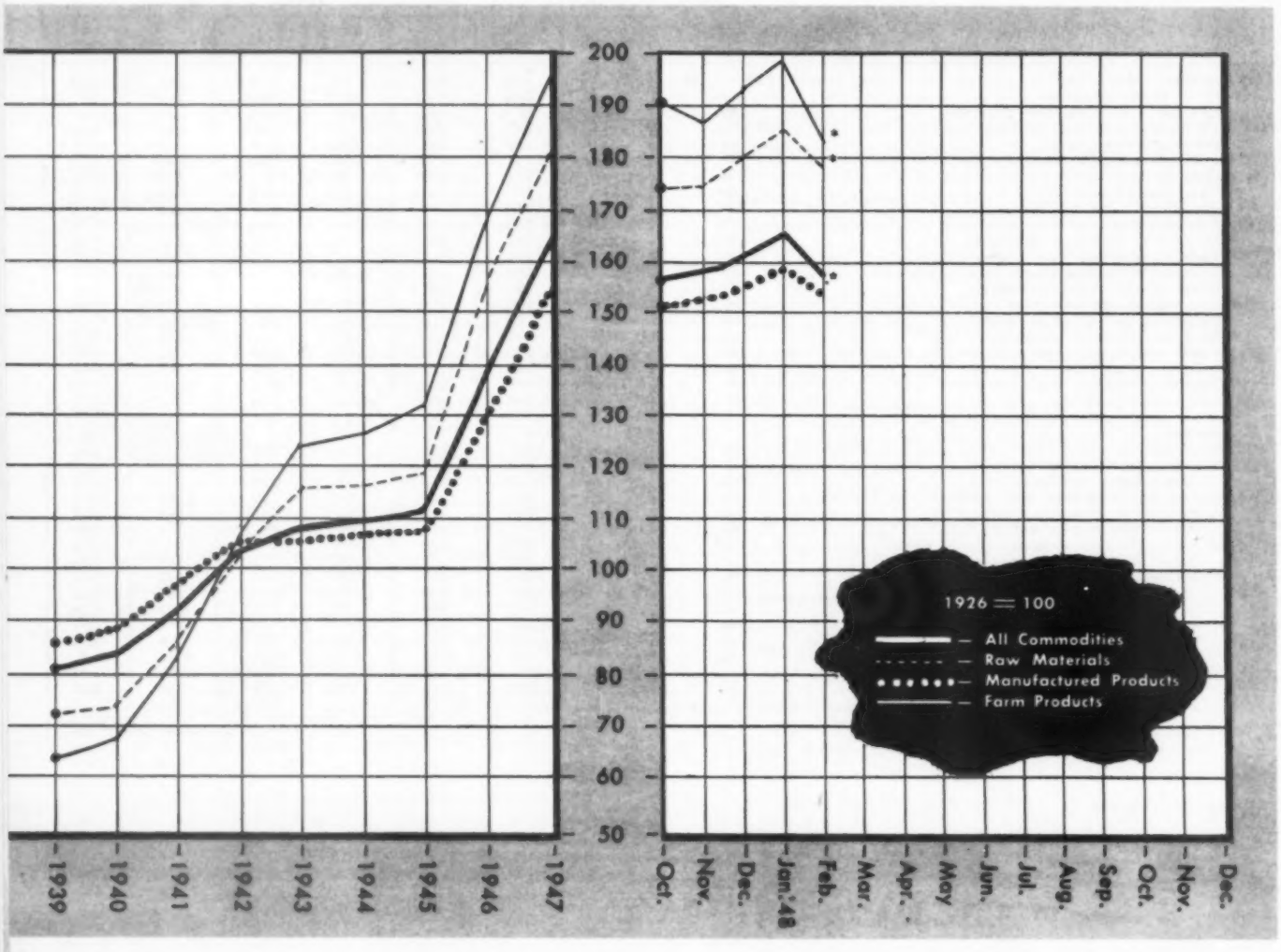
Source — Department of Commerce

N.A. — Not Avaliable

Inventories, Shipments and New Orders Compared With Industrial Production



The Price Picture



*ESTIMATED

Straws in the Trade Wind

The American Iron and Steel Institute has announced that the large postwar expansion and improvement programs of steel companies involve record-breaking expenditures totaling nearly $1,700,000,000 . . . The total amount of iron and steel in use at the start of 1947 is estimated at approximately 1,038,000,000 net tons, or 14,500 pounds for every person in the country, the highest figure in history . . . U. S. Steel Corp. this year will begin operating 10 of 13 new major facilities now being constructed under a $500,000,000 development program.

Southern Alkali Corporation's large liquid chlorine and caustic soda producing plant at Lake Charles, La., was scheduled to reach full production this month . . . Production of ethyl acetate for foreign and domestic use will be nearly doubled at Monsanto Chemical Co.'s Merrimac Division in Everett, Mass. . . . The B. F. Goodrich Chemical Co. will construct a new $3,000,000 general chemical plant in Avon Lake, O.

Voluntary consumer-rationing agreements among oil producers may have a serious effect on strip operations at coal mines using diesel equipment, according to the American Coal Sales Assn. . . . If a proposed model plant proves practicable, the Pittsburgh Consolidation Coal Co. will erect a $120,000,000 big-scale operation in southwestern Pennsylvania for the conversion of coal into gasoline, fuel oils and gas.

Copolymer Corp., Baton Rouge, La., has announced the large scale production of a new synthetic rubber, ultipara, said to excel the best natural rubber.

Federal Reserve figures for the week ending Feb. 4 show a decline of $83,000,000 in business borrowings at member banks in leading cities.

REGIONAL ORGANIZATION FOR N.I.G.P.

● *By John E. Hubel*

Governmental buyers organize Wisconsin Chapter as first regional group within national body

Milwaukee Journal Photo

Left to Right: **J. W. Nicholson, temporary chairman of the organization meeting, confers with B. L. Gill, newly elected Secretary-Treasurer of the Wisconsin Chapter, NIGP, and Frederick MacMillan, Executive Secretary of the League of Wisconsin Municipalities.**

AT a meeting held in the board room of the Milwaukee City Hall on January 23rd, the first regional chapter of the National Institute of Government Purchasing was organized. It is known as the Wisconsin Chapter of the N.I.G.P. Thirty members, consisting of men and women engaged in purchasing work for cities, counties and for the state have signed up, the membership being open to anyone "engaged in governmental purchasing, or being responsible for such purchasing." This includes, in addition to actual purchasing agents, such officials as mayors or city managers. Furthermore, several qualified men and women from any one political division—city, county or state—may join the chapter. At the organization meeting it was decided to set the annual dues in the Wisconsin chapter at the nominal figure of $1 per member.

The following officers were elected by the members present at the organization meeting:

President: Maurice Park, Purchasing Agent for Dane County.

Secretary-Treasurer: B. L. Gill, Purchasing Agent for the City of Madison.

Honorary President: Joseph W. Nicholson, Purchasing Agent for City of Milwaukee.

As temporary chairman of the organization meeting, Mr. Nicholson (who is First Vice President of the parent organization) explained the apparent need for such regional organizations in order to provide greater opportunity for purchasing agents of cities, counties and states to meet periodically for the discussion of common problems. While it is true that the parent organization holds a convention annually, all purchasing agents for governing bodies cannot attend; consequently regional meetings make it possible to discuss current problems in the purchasing line more frequently, and at the local level.

As this was to be the first regional chapter to be organized, Nicholson declared that the national organization was keenly interested, and had decided to be officially represented at the meeting. Albert Hall, Executive Director of NIGP, came to Milwaukee from Washington to outline the aims of the parent group. Hall told of the progress that had been made by the national body since its organization in May, 1944, the first conference having taken place in Milwaukee, at which time Alfred E. Holm, Purchasing Agent for the City of Los Angeles was elected as the Institute's first president. The NIGP had also been incorporated in the State of Wisconsin in September of 1944.

Hall explained that the National Institute was in the nature of a clearing house on public buying, and any member of the Wisconsin group, as well as any member of the national organization, was at liberty to take advantage of the information the national group has in its files, or can gather, on government purchasing subjects. The National Institute has a training program on now, for the benefit of local government purchasing agents. The national group, he declared, is not political; it could not be if it wanted to, but it was organized purely for the purpose of disseminating information to the government purchasing agents of the country.

As is well known, Hall said, centralized purchasing is done by the great majority of industrial concerns. It is gaining ground among local governmental units, but too many

Joseph W. Nicholson, Milwaukee City Purchasing Agent, Past President of the National Association of Purchasing Agents and a Director of the National Institute of Governmental Purchasing since its inception, was unanimously named as Honorary President of the Wisconsin Chapter.

purchases are still being made direct by various departments of local governments, in many instances without even having the orders confirmed by a centralized purchasing department.

At the afternoon session round table discussions were held, with every member present voicing his views on the subject of local government purchasing. It developed that in many instances too much power is being granted the heads of departments of cities and counties to purchase material, and often complete equipment, as required, having the purchasing agent confirm the transaction later, frequently after the material ordered was in use. Most cities and counties, it appeared, are trying to have all purchases made through a centralized purchasing department, but, due to the fact that very many of the items purchased by heads of departments are required for emergency use, some leeway in the issuance of temporary orders, to be confirmed later, must be permitted department heads. However, a lot of abuse is found. All agreed that such blanket authority to purchase should be curtailed, with request for bids on material required being made mandatory, except in real cases of emergency.

Nicholson declared that the help the city of Milwaukee had obtained through membership in the NIGP had resulted in savings great enough to pay for its membership in the national organization for the next 30 years. In Milwaukee, he said, bids are demanded on all material and equipment purchased under contract, most purchases being made on competitive basis, except in cases of emergency, when quotation is required before the purchase order is placed. He distributed to members present records of the Milwaukee purchasing department, showing how information is instantly available as to the former bids or quotations on similar material or equipment.

As tax exemption is claimed on local government purchases of many items of material and equipment, Nicholson also displayed a tax exemption certificate used in his department to indicate that the purchase is being made for a local governing body, and a list of items on which local governments are entitled to federal tax exemptions.

The matter of collusion in bidding came in for considerable attention during the discussions. At this point a special representative of the Wisconsin Attorney General's office, Leonard Bessman, talked on "State Anti-Trust Law Enforcement." A special division had been organized at the state capital since the passing of an anti-trust law for Wisconsin, for the benefit of Wisconsin citizens having claims of anti-trust violations. Bessman said that his office was in position to help any purchasing agent for a local government unit in matters of unfair business practices of any kind, especially where collusion was evident in the matter of bidding on material and equipment.

The Executive Secretary of the League of Wisconsin Municipalities, Frederick MacMillin, told of the willingness of the League to give information and help wherever possible in the solution of problems in purchasing. The League covers the work of municipal government in all its fields in the state. MacMillan's subject at the meeting was: "How the Chapter can Co-operate with the League." Purchasing agents, while generally familiar with the work of the League, are usually not direct members of the League, except through the municipal government for which they do the purchasing.

Specifications in Purchasing

The subject of purchasing according to specifications came in for considerable attention. In these days of demand far in excess of production, a large amount of material has been delivered to municipalities that did not meet specifications, even though specifications were given in full or by classification on the purchase order or contract. In this connection, Nicholson declared that every purchasing agent should have a copy of standard specifications for his guidance in purchasing material and equipment, and have the supplier meet all specifications called for in contracts and orders. Milwaukee, he declared, had been considered a good field for substitution in recent years, and for dumping materials not up to standard, but in most cases such material was not accepted, the exceptions being those in which no other supplier could exactly meet the specifications in these days of difficulty in getting exactly what is needed.

In coal purchases for local governments the great difficulty appears to be the adherence to BTU standards, as specified on purchase orders and contracts. Several up-state purchasing agents made such complaints on coal quality, but it was admitted that in recent years, due to coal strikes and other conditions not under control of the supplier, BTU standards could not be adhered to in every case. Along this line, Nicholson declared, Milwaukee has been rather fortunate, as all coal is bought strictly on BTU content, and, with the competition in coal supply in Milwaukee, the specifications have been rather well adhered to for city coal.

Other subjects discussed at this meeting included warehousing of material for city and county use. Cases of the sale of used equipment

and scrap were recited, in some instances purchasers of scrap taking away more than bargained for, due to the fact that not enough attention was given to weighing out old material, etc.

The purchase of rock salt for use on streets was discussed. Due to the shortage of salt, chemical substitutes were being offered. But, it developed during the discussions, substitutes, while satisfactory for ordinary temperatures, often did not work well when the temperatures dropped below a certain point, whereas rock salt would stand up under most temperatures met. In this discussion it also developed that, due to the impression that rock salt injures tires and shoes, etc., one of the large tire companies had a test made in its laboratory to get the actual facts, with the result that it was found, according to the company's report, that there was no evidence of any injury to tires at all. A copy of the test is said to be available from the Chamber of Commerce, Akron, Ohio, the city in which the tests were conducted.

The matter of salaries for purchasing department employees was discussed. Such information, it was announced, is now the subject of research by the national group.

At the conclusion of the meeting, it was decided to hold periodical conferences in Milwaukee, the date of the next meeting being set for April 23rd.

Albert H. Hall
Executive Director, N. I. G. P.

FEDERAL SALES TAX EXEMPTIONS

Local governmental units may claim exemptions from the following schedule of Federal sales taxes. Exemption certificates must be filled out except where noted.

Manufacturers' Excise Taxes:	
Business and Store Machines	10%
Electrical Energy	3 1/3%
Electric, gas and oil appliances	10%
Electric Light Bulbs & Tubes	20%
Firearms, Shells, Cartridges	11%
Gasoline	1 1/2¢ per gal.
Inner Tubes (see also Tires)	9¢ per lb.
Lubricating Oils	6¢ per gal.
Luggage, handbags, wallets, etc.	20%
Matches, paper or plain wooden	2¢ per M
Matches, wood with fancy or colored stem or stick	5 1/2¢ per M
Mechanical refrigerators, air conditioners & parts	10%
Motor Vehicles:	
Passenger automobiles—chassis and/or body	7%
Busses, trucks & semi-trailers—chassis and/or body	5%
Automobile parts and accessories (except radios, tires and inner tubes)	5%
Tractors (kind chiefly used for highway transportation)	5%
Motorcycles	7%
Musical Instruments	10%
Phonographs and Phonograph records	10%
Photo Equipment, cameras	25%
Sensitized paper, Films, Plates	15%
Pistols and revolvers	11%
Radio receiving sets, tubes, parts (including automobile radios)	10%
Sporting goods (except uniforms and sport clothes)	10%
Tires (see also inner tubes)	5¢ per lb.
Distilled spirits	$9.00 per gallon
(Drawback on nonbeverage alcohol)	$6.00 per gallon
Retailers' Excise Taxes:	
Toilet preparations	20%
Furs and Fur Trimmed Articles	20%
Jewelry	20% of retail prices; except watches retailing for not more than $65.00 and alarm clocks retailing for not more than $5.00, 10%; silver plated flatware exempted
Excise Taxes on Facilities:	
Telephone and telegraph service:	
Local telephone service, including calls for which the charge is less than 25¢ each	15% of charge
Toll Service	25% of charge
Leased wire and teletypewriter service	25% of charge
Telegraph, cable and radio messages Domestic	25% of charge
Foreign	10% of charge
Wire and equipment service (burglar alarm etc.)	8% of charge
Transportation:	
Automobile Stamp Tax	$5.00
Boat Stamp Tax	$5.00 to $200.00
Transportation of Persons	15%
Transportation of Property (no exemption certificate required)	3%*
Transportation of Coal (no exemption certificate required)	4¢ per ton
Safe Deposit Boxes	20%

NOTE: There seems to be no specific provision in the law granting exemptions to municipalities from the 20% tax on rental of safe deposit boxes, although in the past some cities have obtained an exemption through rulings from the Bureau of Internal Revenue.

*Provided consigned to City.

Hon. James Forrestal
Secretary of National Defense

PURCHASING CONTROL UNDER THE ARMY-NAVY

● **By Wayne R. Allen**
Chief Administrative Officer & Purchasing Agent
County of Los Angeles, California

I HAVE just concluded a short tour of active duty in the Army, and while on duty lectured at the Industrial College of the Armed Forces at Washington, D. C. on the subject of Centralized Purchasing Administration and Controls. While preparing my lectures, I obtained the latest information as to purchasing policies and activities of the Armed Services, and in particular, the Army.

Public Law 253, the "Unification Act", which is officially entitled the "National Security Act of 1947", provides for a National Military Establishment headed by a Secretary of Defense. The Act clearly states the broad intent of Congress in respect to procurement by the three component Departments. The word "procurement" is prominent in the duties and functions assigned by the Act.

Basic Outline

The broad ground rules under which the industrial or business activities will be handled are:

Sec. 2—Declaration of Policy—"* * * it is the intent of Congress * * * to provide for the establishment of integrated policies and procedures for the departments, agencies, and functions of the Government relating to the national security; * * *"

Sec. 103—National Security Resources Board—"* * * (c) It shall be the function of the Board to advise the President concerning the coordination of military, industrial, and civilian mobilization, including — * * * (3) policies for unifying, in time of war, the activities of Federal agencies and departments engaged in or concerned with production, procurement, distribution, or transportation of military or civilian supplies, materials, and products; * * *"

Sec. 202—Secretary of Defense—"* * * Under the direction of the President and subject to the provisions of this Act he shall perform the following duties: * * * (3) Take appropriate steps to eliminate unnecessary duplication or overlapping in the fields of procurement, supply, transportation, storage, health and research; * * *"

Sec. 213 — Munitions Board — "* * * (c) It shall be the duty of the Board under the direction of the Secretary of Defense * * * (1) to coordinate the appropriate activities within the National Military Establishment with regard to industrial matters, including the procurement, production, and distribution plans of the departments and agencies comprising the Establishment; * * * (3) to recommend assignment of procurement responsibilities among the several military services and to plan for standardization of specifications and for the greatest practicable allocation of purchase authority of technical equipment and common use items on the basis of single procurement; (4) to prepare estimates of potential production, procurement, and personnel for use in evaluation of the logistic feasibility of strategic operations; (5) to determine relative priorities of the various segments of the military programs; * * * (7) to make recommendations to regroup, combine, or dissolve existing interservice agencies operating in the fields of procurement, production, and distribution in such manner as to promote efficiency and economy; * * *"

Specific Responsibilities

The intent of Congress is implicit in Section 2 of the Act, from which I first quoted. The remaining sections quoted provide the means of executing that intent with respect to procurement or purchasing matters.

First, a National Security Resources Board is formed to advise the President on National Mobilization for war, to include the formulation of broad policy. It should be noted that the National Security Resources Board is not a part of the National Military Establishment, but is an independent body reporting directly to the President. In general, it corresponds to the policy-making elements of the old War Production Board.

Second, the Secretary of Defense is charged specifically to take appropriate steps to eliminate *unnecessary* duplication or overlapping in the field of procurement.

And, lastly, the Munitions Board, under the direction of the Secretary of Defense, is given specific duties to perform in the field of procurement. It *coordinates* the military procurement plans; *recommends* the assignment of procurement responsibilities; *plans* for standardization of specifications; *plans* for greatest possible use of single procurement of technical and common use items; *prepares* procurement estimates; *determines* relative procurement priorities among the three Services; and *recommends* the regrouping, combination, or dissolution of existing interservice procurement agencies.

-AIR FORCE UNIFICATION ACT

Arthur M. Hill, Chairman
National Security Resources Board

In undertaking this important public service, Mr. Hill is on leave of absence from his business connections as executive head of the Greyhound Corporation and several of its affiliates, the Charleston (W. Va.) Transit Company, Kanawha City Company, and many other directorships. In World War I, he served as Assistant Chief of Staff, 77th Division, U. S. Army. During World War II, he was Consultant to the Commission for National Defense and to the Office of Defense Transportation; Special Assistant to the Secretary of the Navy, in charge of the Transportation Branch; Chairman of the Secretary's Committee on Public Works Projects, and Navy Rubber Director.

During the past war, and after V-J Day, there was considerable criticism of the manner in which the Military Services had conducted their business operations. There was criticism of situations wherein two or more Service procurement agencies were bidding against each other; criticism of situations wherein one procurement agency had cornered the supply of an item needed by all; criticism of divergent purchasing procedures, of divergent inspection practices; and criticism of minor and unnecessary differences in specifications for the same product. There were numerous other practices and procedures, relatively unimportant, but which industry also found to be irritating, inefficient, and expensive.

It is true that the Army and the other services successfully met the final test—*they won the war.* Even though they won the war, there are many people within the Services and within Industry who are convinced that the job could have been done with less money and manpower had the effort been better organized and coordinated from the beginning.

The nation had an Industrial Mobilization plan prior to World War II. It was a good plan, but it was deficient in some respects, and it was a Military Plan.

It is conceded by the planners, as well as by the "brass", that business-like administrative methods in the armed forces during an emergency will accomplish necessary ends at an earlier date, with less loss of life, less expenditure of dollars, and less waste of natural resources. War should not be waged by decisions in disregard of sound business principles. Everyone agrees that the armed forces must make energetic efforts to establish sound administrative controls and eliminate weaknesses in procurement and supply now, so that both present economies and preparedness for increased activity during an emergency may be secured.

Unnecessary costs are identical in meaning with unnecessary expenditures of labor and material, and therefore are a menace to the success of any military undertaking. Every unit of labor and every unit of material which is not expended in the most efficient way not only contributes nothing to the result contemplated, but actually retards the operations by consuming resources which might have been applied directly to the accomplishment of some other useful end. On the other hand, a proper balance must be obtained in any undertaking as between its cost and its urgency from the standpoint of time.

Selective Centralization

Hence, we arrive at the belief, concurred in practically unanimously, that a Central Purchasing Agency for the total Armed forces is impractical.

Analysis of the experience of the British Ministry of Supply in World War II is proof that complete centralization bogs down the war effort. With complete control at the outset, the Minister of Supply sub-delegated to the British Army Division of War-like Stores (equivalent to our Ordnance) authority to purchase Ordnance, to the Royal Air Force authority to purchase aviation items, but including special air force clothing, etc., and to the British Admiralty practically the whole line of Naval Stores.

Shortly after the end of World War II, the ANMB was reactivated, and it has sought to correct in its planning the deficiencies that were so evident in the procurement activities of the Services during the war. In the early discussions of Unification, its purely military advantages were fully covered, pro and con. From the discussions there soon emerged, however, questions as to whether savings might be made by unification in the fields of procurement, service, and supply. Cross-service and cross-purchasing (single service purchasing on specified items) were explored, and it finally was concluded by those in authority that savings might be made in those fields, particularly in the field of single service purchasing.

At that time there was no individual in the Government, short of the President, who could direct the assignment of responsibility for procurement of an item or commodity, used by both Services, to one of the two Services. This deficiency was remedied by the President on October 15, 1946, when he gave to the Chairman of the ANMB the power of final decision in the matter of assignment of procurement responsibility.

Prior to September 24, 1946, there

COMMODITIES ASSIGNED TO A SINGLE SERVICE FOR PROCUREMENT

Description	*To Whom Assigned*
SOLID FUELS	
Coal	Navy
Coke	Navy
LUMBER & ALLIED PRODUCTS	
Wood Fabricated Basic Materials (Except: Handles, Pulls, Knobs, Grips, Backs and Kindred Products)	Army
Crude Wood Materials	Army
MARINE LIFE SAVING EQUIPMENT	
Water Life Saving Equipment (Except: Kits, survivors; Still, solar)	Navy
Kits, survivors; Still, solar	Army
Small Craft, as related to Marine Life Saving	Army
CONSTRUCTION, MINING, EXCAVATING & RELATED EQUIPMENT	
Mining Machinery & Equipment (Specialized)	Army
Rock Drilling, Earth Boring, & Related Machinery	Army
Oil Field Producing Equipment	Navy
Power Excavators & Attachments (Wheel Mounted Only)	Army
Power Excavators & Attachments (Track Laying Only)	Navy
Dredging Machinery & Components (Except Hulls)	Army
Scrapers	Army
Tractors, Contractors' (Include only specially designed Tractors, such as Two Wheeled or Dump Body Type) and Dump Bodies for Mounting (Standard Type Tractors are Classified in Major Group 38)	Army
Graders and Maintainers	Navy
Leaders, Self-Propelled, Positive Feed	Army
Contractors' Crawler Carts, Wagons, and Trailers: Full or Half Track	Army
Bituminous Mixing, Paving, and Related Equipment	Army
Concrete Mixing, Paving, Placing and Related Equipment	Navy
Cement Handling and Placing Machinery and Equipment	Navy
Stabilizing, Compacting, and Soil Preparation Equipment for Roads and Streets (Except: Tractor & Truck Attachments)	Army
Railroad Construction and Maintenance Equipment, Power Driven (Except: Railroad Car Mounted)	Army
Special Logging Equipment	Army
Road and Pavement Clearing and Cleaning Equipment (Except: Tractor & Truck Attachments)	Navy
Road and Pavement Repair, Marking, Levelling, and Demolition Equipment	Army
Contractors' Jacks (for supporting trench sidewalls, concrete forms, and related uses)	Navy
Scaffolding, Adjustable and Demountable	Army
ORDNANCE & AMMUNITION	
High Explosives (Single Base)	Army
High Explosives (Mixed Base)	Army
Propellants Smokeless Powder; Rocket Propellants; Pyro Powder	Army
Miscellaneous Explosives	Army
Miscellaneous Explosives	Navy
Cotton (for cartridge bags, lacings & threads)	Army
Silk (for cartridge bags, lacings & threads)	Navy
Ordnance—Assignment by Item	Army-Navy
RECREATION EQUIPMENT, TOYS, GAMES, SPORTING & ATHLETIC GOODS	
Sporting and Athletic Goods (Except: Uniforms & Apparel)	Army

had been in the ANMB the Joint Procurement Assignment Committee. The functions of this Committee were limited in scope and its position in the organizational structure of the ANMB did not give it the prestige or authority necessary to accomplish its mission. On September 24, 1946, the ANMB Procurement Policy Committee was chartered, with functions including the broad field of procurement. One specific duty included recommendation to the Chairman, ANMB, of assignment of purchase responsibility.

Certain classes of commodities have already been assigned to a single Service for procurement, covering the requirements of all Services, as indicated in the accompanying table.

In addition, the following classes of commodities are being considered for recommendation for single Service procurement assignment:

Textiles & Clothing
Hand Tools
Office Supplies & Equipment
Automotive Equipment
Rubber Tires & Tubes
Mess & Galley Gear
Railroad Equipment
Photographic Equipment
Construction Material & Mechanical Equipment
Watches & Clocks

Objectives and Methods

It is not known at this time whether the organization of the Munitions Board will differ greatly from that of the ANMB, or whether the procedures for arriving at a recommendation for procurement assignment will differ from those employed in the past. It is believed, however, that the mandate of the Law as well as the interest of Congress will tend to make the Munitions Board the General Purchasing Agency of the Armed Services, but this will be a rather long drawn out evolution.

It was recognized early in the endeavors to simplify and standardize purchasing practices and procedures, that the Army had a large and difficult task to perform within its own confines in the field of procurement. Including the Air Force, there were eight purchasing agencies, several of which were purchasing the same commodities. Each agency had its own purchasing overhead, maintained separate and independent offices, and employed divergent and different contract administration practices and procedures.

The Committee has already eliminated some duplication and overlap in Army purchasing, and it is be-

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SPECIFICATIONS ARE THE KEY TO EFFECTIVE UNIFIED PROCUREMENT

● *By Charles J. Harter*

MUCH has been said recently regarding the advantage or disadvantage of the merger, consolidation, integregation, or unification of purchasing for the Army, the Navy and the Air Force. Always the claim is made that economies coud be gained and substantial savings in appropriations would result through adoption of such form of purchasing. There are several factors, however, which must be considered in any study of the advantages or disadvantages of centralized purchasing for the National Defense Establishment, else the purpose to which such purchasing effort is directed will be obscured.

Sound Basic Training

First, and most important, is that nothing should ever be done in a military organization in time of peace which must be undone in time of war. A military man must be trained to perform his tasks in such a manner that transition requires mostly expansion and increased effort. The "cadre" is basic in all military organization, i,e, a skeleton which can be expanded quickly and which contains, within itself, all the components of a larger organization.

The practices and habits to which one becomes accustomed in peace should not have to be scrapped, and new practices and procedures adopted, at the time the organization fulfills its purpose. It is akin to training a fire-department to fight fires and then, when the alarm was sounded, change the tactics and require new methods to be employed. Purchasing procedures for the Army, the Navy and the Air Force should be capable of expansion in time of need with no more tension than is produced by opening the ranks to admit additional members.

This basic concept of a military organization all too frequently has been disregarded. The human mind tends to form a pattern of behavior. The first impulse of an untrained person at the sound of an alarm is to run. The purpose in a military organization is to direct that impulse so that he runs to his gun station. Constant and repetitive drill must be devoted to moulding normal impulses to the desired course of action.

If training is directed to the objective and then pointed to a different objective, not only is there delay and confusion during the transition period, but always there is the possibility of a reversion, under stress, to prior habits. One who began his automotive experience with a Model T Ford is very prone to depress the left pedal half-way, because depressing the pedal that far in the Ford placed the gears in neutral; pressing all the way down put the car in low gear. Many of about my time, when confronted with an emergency, will instinctively push the clutch part way down. This is a deep-hidden habit, pulled to the top in an emergency.

Similarly, it has been proven that instruments and controls in training airplanes must not differ from those in fighting airplanes, because the instinct of the pilot is to respond, in emergency, to the behavior pattern formed during the training period, and sometimes the results have been bad. It all goes back to the rule that one should not be trained one way, and then expected to perform a task another way.

Responsibility for Results

Second, the responsibility for results in a military organization never should be diffused. It must ever be specific and direct. An organization charged with responsibility for a given task must control, to such extent as is practicable, *all* the elements required for fulfilling the mission: personnel, equipment, supplies, transport, etc. Of course this is not practicable always, and in each detail, but the concept is sound and deviations or compromises should be known as such, and accepted for the general good. Purchasing, of course, is an essential element of control and an integral part of the military organization.

The National Defense Act placed responsibility for the administration of the Departments of the Navy, the Army, and the Air Force on a Secretary for each Department, subject to overall coordination and direction of the Secretary of National Defense. The Secretary of the Navy exercises complete responsibility and authority within the Navy Department over purchasing. In turn, he has delegated to the Chiefs of Bureaus of the Navy Department authority and responsibility for the procurement of items under their technical cognizance, subject to three considerations:

(1) The Bureau of Supplies and Accounts may procure materials for other Bureaus on their request.

(2) The Bureau of Supplies and Accounts is responsible for procurement of common-use items.

(3) The Secretary will allocate to a single Bureau the procurement responsibility for an item required by two or more Navy Bureaus.

These considerations promote centralization of purchase within the Navy Department.

Importance of Specifications

The National Defense Act was designed to promote coordination between the Army, the Navy, and the Air Force. The Secretary of the Navy represents the Navy Department in the coordination of procurement by the Army the Navy, and the Air Force. He has prescribed that when it has been determined that an item in use within the Navy shall be subject to single Department procurement (i.e., bought only by one service for the use of other services), the Purchasing Department shall obtain from the Requesting Department the specifications which shall govern procurement and such specifications shall be used for the procurement for the Requesting Department.

Single Department Procurement thus provides centralization of purchasing but not centralization of specifications. Those with experience in purchasing for a number of similar activities will understand that adoption of common specifications, particularly for technical use, is a difficult task. Each user is agreed on the need for a common specification. Always, he is also agreed that *his* specification is the only acceptable one for use by all.

The Secretary of the Navy has prescribed, also, that in any Single Department Procurement, the Pur-

chasing Department shall review the specifications of the requiring Departments and determine if they are of interest in the preparation of a Joint Army-Navy Specification, or a Federal Specification. If so, then the Purchasing Department is responsible for taking action to initiate a project with the Army-Navy Joint Specification Board for adoption of a common specification.

This may seem like an invitation to the Purchasing Department to stick its collective head into the lion's mouth. It is not my purpose to argue against this provision, because it has value. Certainly a practical purchasing officer could do much to bring up for review points which impede effective performance of purchase responsibility. But every purchasing officer also knows that while some deviations in specifications are superficial and could yield readily to a common specification, others are very important and cannot be changed.

It should not be the responsibility solely of the Purchasing Officer to determine when action shall or shall not be taken. He should be given some aid or backing in this venture. I am reminded of the old time bartender who became familiar with a lot of details from hearing his customers, but who never posed as an authority on anything. The Purchasing Officer gets to know a great deal about a lot of things, but always he should be able to fall back upon technical or related specialized knowledge to confirm his conclusions. Otherwise, he is headed for certain destruction.

What's In a Name?

Two illustrations should suffice: First, a Naval Shipyard ordered long-leaf pine timbers for bracing the hulls of vessels under construction. It was emphasized that this was dangerous work; the timbers were used again and again; they supported hulls on which men were working. Only long-leaf pine would do. When the shipment was received it had been inspected at the source in North Carolina by a representative of the national association of this product. The local inspector rejected the shipment because it was short-leaf. The user would not consider taking it under any consideration, price or otherwise. He wanted long-leaf pine and he was going to get it.

The first step in resolving this controversy was to submit representative samples to physical test, along with similar samples from long-leaf pine in store. The second was to bring the two inspectors together. The result of the test was to confirm the suspicion that there was no physical differences between the two lots of samples. The second was that the two inspectors wanted to journey to North Carolina to look at the leaf of the tree. It seems that in that area the lumber from long-leaf and short-leaf pine is practically identical; only the leaf would indicate the origin. This confirmed, of course, the result of the physical tests; it was accepted as long-leaf and used, and everyone was happy.

Note carefully that no attempt was made to force a different product on the user; he had set up certain standards and had given a name to those standards. When it was certain that the offered product met these standards, it mattered little what name was given to it. This is the essential in common specifications, that standards be established to measure performance and a product which promises similar performance and which can make good such promise should be considered.

Another illustration concerns lubricating oil. A Navy vessel, proceeding along the Latin-American coast in North America, ran short on lubricating oil and put in at a local port to replenish its stocks. The Naval station at that port did not have this type of oil and asked permission to make a substitution. Ordinarily, the substitution, by reason of viscosity and other factors, would have been satisfactory, but the petroleum specialist who was assigned to decide this question knew that during the war certain additives had been used which precluded the substitute oil from the intended use. However, knowing the intended use, it was not difficult to offer several commercial brands of oil, known to be available in that area, for the intended use and they were issued. Here it is a case of knowing the limitations of a product, and the requirements for an intended use.

For one-time usage, intended use is pertinent. For repetitive issue, particularly in a military organization and during periods of operations, intended use oftentimes is misleading. This is the factor which so often prompts the technical folks to reject a deviation from a standard specification. They simply do not know all the applications of a product, nor what may happen in the future.

It is probable that this one factor is the major obstacle to the adoption of common specifications, first as between the activities of the Army, the Navy, and the Air Force, and second, within these Departments. The idea of common specifications is not new.

MUNITIONS BOARD PROCUREMENT POLICY COMMITTEE . . . . . .

Major General Edward M. Powers, Air Forces, Chairman

Brigadier General August W. Kissner, Air Forces alternate member

Major General Orval R. Cook, Army Service, Supply and Procurement

General Dawes, as first Director of the Federal Budget, gave a dramatic demonstration at his first Budget meeting with representatives of all the Federal Departments in Washington, by holding to view a number of corn-brooms. There were Navy brooms, Army brooms, Coast Guard brooms, Department of Interior brooms, etc. General Dawes wanted one or two *standard* brooms, applicable to all Federal uses. Much progress has been made in this effort, through the adoption of Federal Specifications and through centralization of purchasing under the Federal Bureau of Supply.

Call In the Producers

What can be done in addition to the measures thus far described? First, it is contended that no common specification be considered for adoption for Single Department Procurement until representatives of the producers of that item have been consulted and have been given an opportunity to present their views. The views of a producer are important in peace-time; they are doubly so in time of emergency. Perhaps the specifications require practices or methods which are unduly costly of time or effort, without corresponding benefits. Perhaps they require the use of facilities or equipment which is in short supply, and for which other equipment is equally satisfactory. There are many items on which a producer will be happy to comment.

It is plain that if the Purchasing Department lays itself open to this sort of proposals, it will have quite a headache. It will be in the middle for certain. It would take not only a lot of time, but the answer never would be conclusive. It would be doing the job the "hard" way. My proposal is somewhat different. I would like to have the matter of common specifications approached from two sides: (1) a direct frontal assault through the Purchasing Officer and the Army-Navy Joint Specification Board; (2) infiltration through the trade associations.

This is not a new idea. It was in use as far back as 1928, to my knowledge, in the procurement of airplane parts, and served to introduce the "Army-Navy Standards" for airplane fittings, parts and equipment. Each year there would be a meeting of those in the Navy, the Army, and industry, concerned with parts for airplanes and engines. These meetings sometimes were quite strong. As I recall them, the Army and Navy always were accused of requesting the impossible; industry was always charged with lagging behind. Nevertheless, from these meetings came agreements as to standards which were applicable not only to the Army and Navy procurement but, many times, to civilian use as well. Constant effort is being devoted to bringing these "A-N Standards" to a current basis.

Alternate Bids

The frontal assault may best be furthered by the submission of alternate bids by industry. Such alternate bids should be supplemental to the bid under the specifications, but differences between the alternate bid and the specification bid should be clearly stated, and the pertinent factors — such as commercial practice, simplified manufacturing processes, inclusion with production runs, etc.— should be stressed.

The way is open to such alternate bids, because the Secretary of the Navy has specified that when specifications are used, they should contain only the essential or minimum requirements, in order not to limit competition and, whenever possible, permit alternative materials or designs, although reserving the right to reject such alternatives if they will not result in supplies or services suitable for the intended purpose.

The submission of an alternate bid would provide the Purchasing Department the means to review specifications to determine those of such interest that joint Army-Navy or Federal Specifications should be prepared. An alternate bid which approximated all the essential details of differing Requesting Department specifications, especially where lower in price, or which embodied simplified manufacturing processes or procedures, would furnish a real basis to the Purchasing Department to review the need for a common specification.

Alternate bids pose some problems of administration. Even though an alternate bid is acceptable to a Requesting Department, the Purchasing Department must decide whether acceptance is fair to the other bidders under the specifications. Many times I have listened to this story. "You specified what you wanted. I bid on exactly that product. Now you want something different. I could have bid differently, also, had I known. Why don't you make up your mind before you issue the invitations to bid, and save your time and money and our time and money as well?"

In such a case the Purchasing Department normally will have two courses of action open:

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(Photos by U. S. Army Signal Corp, Army Air Forces, and U. S. Navy)

Brigadier General John K. Christmas, Army Service, Supply and Procurement, alternate member

Rear Admiral Morton L. Ring, USN

Rear Admiral C. E. Braine, USN, alternate member

PURCHASING AND QUALITY CONTROL

● *By Stuart F. Heinritz*

How two important industrial functions can work together for better products and greater values

ACCORDING to good scientific procedure, we ought to start with a few definitions in a discussion of this kind, in order that we may have a common premise. At the outset, therefore, let us note three things that are characteristic of the purchasing job in any type of enterprise. Then we can tie in the relationship of purchasing and quality control to these three points.

First, the purchasing agent's position in business organization and operation is unique in that his contacts are always in two directions—internally, with those within his own organization whose needs must be satisfied by the things he purchases, and externally, with the companies from which he procures the products and services required. In the process of procurement, the purchasing agent must interpret his company's need to the supplier, in order that the product purchased may be most suitable to the need. Conversely, he must interpret the supplier's proposal to his colleagues in design, manufacturing, and other departments, again relating it to the need. Frequently he is the means of bringing the two together in person, the supplier and the user. In any case, it is his responsibility to bring about a meeting of minds as to what is acceptable.

Secondly, the purchasing agent is a negotiator. The essence of successful dealings with suppliers, and the establishment of sound and satisfactory vendor relationships, on all but the most routine requirements, is a matter of negotiation. A purchase negotiation is not concerned with price alone, nor is the word synonymous with compromise. It is concerned with every detail of the product under consideration and with all the terms and conditions of the transaction; it is the means of bringing about that meeting of the minds for the common good and for mutual satisfaction.

It is equally true, and equally important to remember, that the internal relationships and decisions are also based on negotiation. The word is not commonly used in this connection, but it is nevertheless an accurate description of what takes place whenever two or more viewpoints have to be reconciled, as in the writing of a purchase specification, or in determining the relative weight to be attached to such factors as quality, precision, availability, convenience, assurance of supply and cost. It is not a question of who shall tell whom what is right, but a question of deciding what is to the best interest of the company in the end result. The answer is rarely so obvious that the process of discussion, or negotiation, can be dispensed with.

Thirdly, it is the purchasing agent's constant responsibility to get maximum value for his company's dollar. Management properly expects this of the purchasing department, and in the long run management rates purchasing performance by this criterion.

Quality is, of course, a factor of value. But quality alone is not the measure of value. Whereas quality is the prime factor and objective for the engineer, the purchasing agent puts it on one side of the scale and balances it over against the dollar sign of ultimate cost, and sooner or later in this process he runs into the law of diminishing returns. If purchasing agents, over the years, have earned a reputation as over-zealous advocates on the side of the dollar sign, it may well be because those engaged in other functions or phases of business have been too little concerned with the practical realities of cost. Management has reason to be grateful when both viewpoints are intelligently and vigorously represented in the company councils.

These characteristics of purchasing are stressed at the outset because they are fundamental in any consideration of inter-functional relationships. For it follows that in dealing with purchase factors, the quality control engineer must recognize that he has the dual problem of coordinating with his own purchasing department and of contributing to the satisfaction of the customer's purchasing agent; he must be prepared to negotiate the claims of his particular function; and he must know that the ultimate decision will rest upon a determination of value.

The science of quality control, in its general application to industrial operations, is relatively new and it has had to find its proper place in the complex industrial organization. It is natural that in this process of adjustment, some frictions developed before the gears meshed smoothly, some toes were stepped on, some cherished prerogatives violated.

Working Together

It is my observation that these particular difficulties have been pretty well ironed out by now. As recently as two years ago, a joint meeting of purchasing and quality control men could be relied on to develop a first-rate argument. Today, purchasing and quality control understand each other better, and with an understanding of what each is trying to accomplish comes a respect for methods and for the bounds of authority. Still it may be helpful to review briefly the prerogatives that are necessary to do an effective purchasing job, in order that the two functions may work together most harmoniously and effectively.

By and large, the purchasing agent has no ambition to be the sole arbiter of what shall be purchased. Purchases are made to meet needs that arise in operating departments. The purchasing agent has a right to expect that these needs, and the minimum quality or properties required to meet them satisfactorily, shall be specifically defined as the basis for his search for a supplier and for evaluating products. He has a right to participate in the formulation of that specification to the extent of being assured that the various alternative possibilities have been given thorough consideration, that the definition does not unnecessarily restrict competition and deprive him of the opportunity of selecting a supply source from among alternative vendors, that it conforms so far as practicable with commercial standards and usual commercial practice in the field concerned, and that allowable

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tolerances are as liberal as possible for the intended purpose, without sacrifice of necessary quality and without a cost premium for excessive quality factors.

The purchasing agent recognizes the soundness of a policy that separates the responsibility for procurement and for acceptance. It is his part of the job to find a supplier who can and will meet the quality requirements, whose delivered products will be "up to print". But in fairness to both the vendor and the buyer, the quality standards by which such performance is to be measured should be clearly understood and not subject to change without notice, for they are an integral part of the negotiation and the contract.

The purchasing job requires time for efficient performance. Time is needed for exploration of the market, for research studies of sources and facilities, and of substitutions that may be necessary or desirable for developing competition, and for negotiation. Furthermore, the time element is customarily involved in term contracts and forward commitments. Consequently, when any change in quality factors is contemplated, the purchasing agent has a right to expect that he will be consulted and given the opportunity to complete or adjust outstanding orders and to balance out current stocks.

Dealings with Vendors

Most important of all—and this is a prerogative that the purchasing agent will defend to the utmost, whether dealing with quality control or any other functional department—he will insist that all dealings with vendors be carried on through the purchasing department. The reason for this insistence is simple, and it is basic. Good vendor relations are the most valuable asset that any purchasing department can have; no purchasing program is stronger than its vendors and their loyal cooperation. These relationships are carefully cultivated over long periods of time. Properly nurtured, they are sturdy enough to carry a company along through the most difficult times. Yet withal, being a product of personality and human relations, they have rather a delicate constitution and can be easily blasted by impersonal or inconsiderate treatment. An arbitrary notice of rejection, or even the receipt of correspondence from someone not known to the vendor, who has not figured in previous negotiations, can do untold damage to such a relationship and give a serious setback to a company's service of supply.

Therefore, if materials are deficient, the proper procedure is to report that deficiency to the purchasing department, and only through that department to the vendor. In making this suggestion, purchasing does not ask quality control for one moment to compromise or to relax its quality standards. Rather, look at it this way: if the purchased material or product is unsatisfactory, it is the purchasing department that has failed to meet its obligation, either by selecting the wrong vendor, or in failing to make the requirement clear or holding the vendor up to the necessary standard of performance.

Correcting Errors

If the vendor is at fault, there is no one in the entire organization in a more favorable position to secure corrective action than the buyer who is familiar with the entire background of the transaction, who knows the extenuating circumstances, if any, who has the personal contacts with responsible persons in the vendor company, and wields the potent leverage of future business dependent on good will and satisfaction. Moreover, the buyer is keenly interested in knowing about the fault and having it corrected, for in the constant effort to build up a reliable corps of suppliers, excuses do not take the place of reliable deliveries, and experience is the best guide in the placing of future orders.

The development of a satisfactory source of supply is frequently a process of education. Errors, however deplorable, can be a most effective means of education, contributing to lasting improvement and satisfaction. Unless it is a case of flagrant carelessness or incompetence, there is little to be gained and a great deal to be lost by discarding all that has gone before and starting from scratch to educate a new supplier. And the process of education can work both ways. There are plenty of instances on record where the supplier, called to account for a faulty delivery, has been able to show that the basic fault lay in what he was asked to do—that the wrong material was being specified for a given purpose, or that a part specified as a stamping ought to be made on a screw machine, or *vice versa*. Purchasing agents are practically unanimous in their testimony that friendly suppliers and salesmen are among the most potent sources of valuable information and aid. Even engineers and quality technicians are not beyond the possibility of acquiring similar helpful information from the same sources.

The third practical reason why rejections should be handled only through the purchasing department is that there are several alternate ways of making an adjustment for deliveries that fall short of specified quality standards, other than returning the goods to the vendor. One of these has already been suggested, in that the supplier himself may counsel on the proper application and handling of his product so as to render its performance satisfactory. Another is the diversion of such goods to other purposes for which they may be thoroughly suited. These suggestions are not offered by way of condoning lapses in quality or to justify any lowering of standards; they are merely the practical means of making the best of an unfortunate situation. It is obvious that persistent recurrence of such errors means that a supplier is an unsatisfactory source, and outright rejection is then indicated.

The alternative in which we are particularly concerned here, and which will doubtless be repugnant, at first glance, to the quality control engineer, is an adjustment in price which will fairly reflect the lower value of the lower quality to the buyer's company. If such an adjustment can be made, it may frequently be expedient to do so in these days when replacements are difficult to obtain and long delays may be encountered. Basically, the principle involved is the same as in setting the original specification—to get usable quality representing a fair value for the expenditure; in this case, the principle is applied after the fact of purchase instead of before the fact. It goes without saying that the election of this alternative is not a purchasing prerogative. It is a matter that calls for negotiation, first with those having the responsibility for quality within the company, and only then negotiation with the vendor. Functional specialization does not set one department of a company against another; it is the means of assuring that all pertinent viewpoints shall receive full consideration as they work together for the best interests of the company as a whole, toward the ultimate objective of value. To this end, all departments—whether concerned with the science of quality, or the science of production, or the science of procurement—must be willing to negotiate to arrive at the most favorable overall solution.

The Customer's Viewpoint

The external relationship of quality control to the purchasing policy and practice of the customer's com-

pany is equally important as it affects product acceptance and sales, and is one of the major factors that will, in the long run, have considerable influence in justifying or failing to justify the policy and practice of quality control.

Again let us start by establishing the points of common agreement. Quality control adds to the value of a product in the way of greater uniformity, fewer rejects, better manufacturing controls and dependable inspection. The person to be convinced of this, beyond your own management, is the customer's purchasing agent, for in line with the responsibilities and prerogatives outlined in the preceding section, he is the primary buying contact with your company's sales organization. He is receptive to the quality control story at least to the extent that he is willing to concede that, all other things being equal, the manufacturer who practices quality control is a preferred source of supply for the reasons just cited.

But how strong is his conviction on this point? Is it strong enough to result in buying action? The rub comes in that little qualifying clause, "all other things being equal." He knows from experience that all the conditions surrounding a purchase are seldom, if ever, equal. You may argue with excellent justification and to good effect, that the application of quality control techniques actually creates a state of inequality with all the advantages on the side of your product.

Tell the Buyer

However, the purchasing agent must be convinced on this point. Ideally, we would like to be able to say that the alert purchasing man will eagerly delve into this matter of quality control, make a broad and searching analysis of its values, convince himself, and beat a path to your door. But we must be practical. The burden of proof is upon the supplier. The most successful vendors are those who maintain an adequate staff of well qualified sales representatives; and as we go into a more highly competitive period of business, both the number and the calibre of sales representatives are on the upgrade. There is an important lesson in this for the field of quality control, and one of the effective instrumentalities for putting that lesson into effect is at hand in the advertising and sales representation of your respective companies, carrying the message to the buyer.

First of all, let the purchasing agent know what you are doing in the way of quality control, and what you are accomplishing by this means. Most purchasing agents make it a point to rate suppliers according to their facilities, their financial stability, the character of their management and supervision, their progressiveness as evidenced by research activities and other indicators, all of which stand behind a company's product and service. Surely an effective policy of quality control is one of the factors that should be brought to his attention most forcibly, not only in its contribution to quality of product, but as one of the marks of progressive management and operation.

Let the Record Speak

Secondly, if the purchasing agent is not personally familiar with modern methods of quality control through experience in his own organization, it will pay to take the trouble of explaining in detail what your objectives are and how you arrive at them. You will find him interested, and quite capable of assimilating the information. A substantial majority of purchasing agents today, particularly among those who have entered the field during the past fifteen years, have a background of technical training and productive experience. They are quite competent to read your charts and graphs, but an explanation by an expert in your field would be most helpful in assuring that they will grasp the full significance of the record as it shows the values that are of primary importance in a purchasing decision.

Third, it will be helpful to furnish actual quality control records to your customer with shipments of the products to which they pertain. This is the added certification to the user of the quality that he is obtaining as a result of your skill and effort, a constant reminder of the special values inherent in your product, a guide to what may be expected in its application and use. This extra service adds materially to the value of the product to the user. Even more, it strengthens the relationship between the user and supplier.

Fourth — and this point is basic in all of the preceding suggestions — you can enhance the merchandising value of quality control by putting yourself in the customer's place and evaluating your contribution to the overall industrial process, not only in terms of absolute quality or precision as ends in themselves, but in terms of ultimate utility and cost to the buyer. For this is fundamentally the justification of your function; it is what you have to sell.

It is a fine thing for all of us to believe in the particular job we are doing, and to be enthusiastic about it. But the real test comes in the acceptance of these values by those whom we serve, whether in purchasing or quality control or any other function, and this acceptance may be the more accurate measure of worth. As your product goes out upon the market, there will be many cases where quality control might easily be oversold, since in the broad range of industry and industrial products there are many instances in which precision and uniformity are of secondary importance, and where the cost of elaborate control methods represents purchasing waste. At the same time, there are many cases in which the utmost progress you can make in this direction is worth many times the effort and the cost involved. Quality always commands a premium, and wherever that premium is economically justified, the producer who consistently maintains quality standards is the leader in his field, the preferred supplier for users of that product.

Broad Objectives

The suggestions made in this discussion have purposely been kept on the prosaic level of everyday operations. In conclusion, they should be correlated so as to fit into the larger picture of functional objectives. The quality control engineer has many relationships to consider, with a variety of other functions within and beyond his own company organization, to fulfill his function most effectively. So far as purchasing is concerned, the responsibility of this relationship with quality control is to work together for an integrated policy and program that will provide the plant with adequate materials and parts, that will utilize them most efficiently, and will offer maximum satisfaction and value to the customer. Each company's end product becomes the purchased component or raw material of the succeeding owner. The industrial ideal toward which we should set our sights views this progression as a continuous, integrated process, from raw material to ultimate consumer, with the appropriate quality and value as factors to be considered at each successive stage. In the complex organization and functional specialization of modern industry, there is no more potent means of achieving this dual objective than through mutual understanding and cooperation in the relationship of purchasing and quality control.

STANDARDS OF QUALITY

• Their Meaning and Application in Hospital Buying

• ***By Dewey H. Palmer***

IT goes without saying that quality is one of the most important factors in the procurement of hospital supplies and equipment. To know what quality is required, to define this quality accurately, and to locate a product of the quality desired at a most favorable price is a difficult task requiring all of the purchasing agent's ingenuity and skill. In these days of inflated prices and doubtful quality, effective methods for improving standards of performance are particularly important.

The Meaning of Standards

A standard or specification is a precise definition of those qualities of a product which are important to its end use.

Do not be misled by the simplicity of this definition. Any standard worth the paper on which it is written must be as precise and accurate as is necessary to eliminate all possibility of substitution of inferior materials or poor construction. Anyone who has attempted to write a specification for even the simplest item is aware of the complexities involved in this task.

There is a fundamental axiom that should be borne in mind in the preparation and use of standards. From a strictly scientific point of view there is no important service quality of a given product that cannot be measured and accurately defined. In other words, if a product has a desirable quality, it is possible to define that quality in terms of laboratory examination and tests and write it into a specification.

There seems to be a prevalent notion abroad that there are many mysterious qualities about products which enhance their value to the exclusion of all other products competing with them. This is particularly true of certain cleaning compounds, drugs and pharmaceuticals, and surgical and medical supplies. This is an unsound basis for selecting products for institutional use. Beware of salesmen who refer vaguely to secret processes, special patented features, and newly discovered ingredients which place their product in a unique and noncompetitive position. There are few important trade secrets in the field of hospital supplies. The buyer should generally assume that an important quality in a product he is buying can be defined and specified when the order is placed.

Defining Quality

Unfortunately, the most common method used in defining a product is a simple description such as "10 dozen muslin sheets, size 63 x 108," or "10 gross clinical thermometers." There is little control of quality in ordering on such a basis.

Another method commonly used is to specify a particular brand when placing the order. This procedure, of course, is justified if other important brands have been studied and compared. But too often it is an easy way out, and the purchasing agent has not taken the time to compare quality and price.

A third method frequently used is where the buyer attempts to tie quality down to a particular item previously used. In such a case he will specify that the product ordered be equal to or better than the sample of

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a particular brand submitted or referred to. This is an improvement over the two previous methods, but frequently competitive bids are not submitted as other manufacturers do not make a product similar to the one mentioned although their product may perform equally well.

The only scientific approach to quality control is to refer in the order to a specific standard or specification which defines every important quality. Such purchasing procedures are now universally used by Federal, State, and Municipal agencies and all large industrial firms. Imagine Ford or General Motors using vague general language in describing materials to be used for the production of automobile frames or piston rods, or safety glass. Industry is fully aware of the economies and quality control of the end product which result from using exact technical definitions for the materials they purchase.

Advantages To The Buyer

When a buyer refers to a particular standard in placing his order, he is legally protected against substitution and inferior quality.

By referring to a particular specification it is possible for the buyer to obtain bids from several vendors of products of identical quality. Bids are meaningless if the products are not equal in their performance characteristics.

It frequently happens that when a careful analysis of the quality requirements of a needed product is made, the standard developed will describe an item that is less expensive than previously thought necessary. Wherever possible, standards and specifications in common use should be used. Otherwise it will be necessary to consult the manufacturer regarding production problems.

Buying standard, mass-produced items results in all around economy, both from the standpoint of manufacturing costs and hospital inventories.

Checking and Testing

It is not enough to specify in placing an order that the product must meet the requirements of such-and-such a standard. Too often vendors will know from past experience that the product will not be checked against standard requirements and will deliver goods below the quality specified. It becomes necessary, therefore, to select samples from all large shipments and examine and test them against the requirements.

Let me give you a few examples of what the tests of the Hospital Bureau of Standards and Supplies have shown with reference to the quality of products when compared with recognized and widely used specifications.

Several years ago the Hospital Bureau tested a large number of rubber gloves, including samples of nine different manufacturers. Gloves from only two manufacturers were found which met the requirements of Federal Specification ZZ-G-421a completely. Aside from inability to meet weight and thickness requirements, the chief failure found was the loss in tensile strength after the aging tests. This test, of course, is of particular importance if gloves are stored or are in service for several weeks or months. While the tests for the tensile strength as received, after aging, and after sterilization, and the test for elongation and tensile stress are not positively related to the resistance to puncture, they undoubtedly have a close relationship to resistance to tearing. As a minimum requirement these tests should be met without question by all surgeon's gloves. I might say in passing that there appeared to be no relationship between quality and price, nor were the two or three brands principally used in hospitals outstanding in their compliance with the Federal Specifications.

For six years the Bureau has been regularly testing several hundred thermometers annually. Until very recently we have consistently found failures ranging up to about 45%, including all major brands, when tested against the requirements of Commercial Standard CS1-42. This, despite the fact that enclosed with every thermometer was a certificate stating that the thermometer met the requirements of the Commercial Standard. Loss of pigment has been the most common type of failure, although accuracy failures have been on the increase. The National Bureau of Standards is now cooperating in a study of new types of pigments, and it is our expectation that a pigment that can stand up indefinitely will soon be developed.

Syringes and Soap

In a test of all major brands of hypodermic syringes completed before the war, we found not one brand for which all the samples fully met the requirements of Federal Specification GG-N-196. I am sure that the Government when purchasing syringes would not pass syringes of the quality we tested. It stands to reason that if hospitals were buying their syringes on the basis of a definite specification with some samples tested in each shipment, there would be less likelihood that they would obtain second or third grade syringes.

Although the tests covering such factors as leakage under pressure, accurate calibration, and residual glass strains can be made only in the laboratory, there are certain qualities which can be checked by careful inspection. These include examination of tip and barrel and cylinder walls for pits, scratches, blow holes, coincidence of end of plunger with zero mark on scale, free movement of plunger within the cylinder. There is available a small polariscope which a purchasing agent can use to detect residual strains in the glass. Check testing of this limited amount would undoubtedly serve to improve the quality of syringes regularly sold to hospitals.

As a result of the efforts of the Committee on Simplification and Standardization of Hospital Furnishings, Equipment and Supplies of the American Hospital Association, a Commercial Standard CS136-46 covering blankets for hospitals has been completed. This standard does several important things for the purchasing agent. It provides minimum quality standards for the three most important types of blankets used in institutions and establishes a simplified list of sizes. It gives the purchasing agent a reference point from which he may judge any of the all-wool or part-wool blankets purchased for his institution and should, through the use of the list of manufacturers accepting the standard, provide a source of supply for blankets of the minimum quality specified.

Probably no textile commodity has shown wider variation in quality characteristics than wool and part-wool blankets. As a result of a complaint from one of our institutions, we had occasion recently to test a blanket of one of the well known manufacturers. The blanket proved to be entirely satisfactory in all respects—including tensile strength, thread count, weight per square yard —except for shrinkage. The manufacturer had stated that the shrinkage would not exceed 5% when tested in accordance with standard methods. The standard shrinkage test actually disclosed a shrinkage lengthwise of about 10%. In this instance we were able to obtain a substantial replacement with a better blanket because of the irrefutable proof from a recognized laboratory that the blanket shrank excessively.

There is one quality that should invariably be known when soap is

purchased, namely, the cost per pound of dry soap. No hospital that I know of today can afford to pay soap prices for water. Probably no type of soap offers a greater opportunity for wasting money for water than liquid and paste soap. Too often a high-sounding technical name applied to a surgeons' or baby soap is more effective in selling the soap than purity and soap content. In an analysis made in 1946 of seven brands of liquid soap, we found soap content ranging from about 20% to 35%, while the paste soaps ranged in dry soap content from 35% to 61%. One liquid soap included in the test cost 38¢ per pound of dry soap, while another of no better quality but with a fancy name cost $1.41 per pound of dry soap. Both soaps were tested against U.S.P. requirements and were equally satisfactory.

A research program worked out in cooperation with the hospital standards committee can also reduce the hospital supplies cost by checking and eliminating many new products which are worthless or not adaptable to hospital use. On the other hand, such a program will also disclose products which have greater service value than other products regularly used.

Practical Suggestions

Hospital buyers who have attempted to use standards and specifications in their buying are well aware of the difficulties of locating sources of supply of products that meet all the requirements. Here are a few suggestions that may be helpful.

First, may I suggest that you obtain all the Federal Specifications that cover the types of commodities you regularly purchase. Specifications are available on such items as soaps, paints, cleaning compounds, cotton textiles, paper products, and many medical and surgical products. Even if these specifications are not referred to specifically in placing your order, they will be an excellent source of information about the quality that should be considered when purchases are made. Also obtain any specifications pertaining to your purchasing from your state, county, and municipal governments. Your problem will then be to find manufacturers who regularly make these products to meet the specifications. The Army and Navy Procurement Divisions of the Government as well as your state and county purchasing agents will be good sources of information. The National Bureau of Standards has issued a "Willing-To-Certify List of Manufacturers" for many types of products.

Obtain a complete list of the Commercial Standards from the National Bureau of Standards covering hospital and institutional supplies. Many of these have been prepared by your own Simplification and Standardization Committee and the list of acceptors should be a valuable supply source. In this connection may I emphasize the fact that unless the standards prepared by your Simplification and Standardization Committee are constantly used, their effectiveness will be reduced and manufacturers will lose interest in producing goods to meet the required quality standards.

There are several other sources of standards which are too often neglected. All laundry and toilet soaps are covered by specifications prepared by the American Society for Testing Materials. The same organization has promulgated standards for paints, fuels, textiles, and paper products, and is the chief standardizing agency on test methods in the United States.

Every responsible manufacturer of gas appliances is now a member of the American Gas Association. In addition to safety and burner efficiency, the standards set up by the AGA cover construction features and have established a quality product for the whole industry. Purchasing any gas burning equipment which does not carry an AGA seal is taking an unnecessary risk.

Just as no drug having therapeutic value should be purchased without a U.S.P. label, no electric appliance should be purchased without the Underwriters Laboratories seal of approval. Unfortunately the seal does not cover all quality factors but is principally limited to safety requirements. However, such safety requirements are essential for all electrical equipment used in hospitals. The Underwriters seal should also appear on all fire fighting equipment and is now available for waxes which meet the Underwriters standards for non-slip properties. Many insurance companies are specifying the Underwriters seal for floor waxes in setting up their rates under accident insurance policies.

Every hospital purchasing agent should have a copy of the pamphlet "Apparatus Accepted" which is issued by the Council on Physical Medicine of the American Medical Association. Standards have been established for diathermy, fever therapy, metabolism, oxygen therapy, and respirator equipment and ultra violet lamps by this Council, and only the products of those manufacturers meeting the standards are listed as approved. Buyers will be protecting their institutions as well as assuring themselves of high quality standards when purchasing such equipment included in the A.M.A.'s accepted list.

The American Dental Association performs a similar function for dental remedies.

Several commercial laboratories such as the United States Testing Company and the Electrical Testing Laboratories have prepared standards of quality which must be met before a given product is given the laboratory's seal of approval. A list of such approved items will be of definite assistance to the buyer in his efforts to obtain quality merchandise.

Cooperative Research

You may well ask how a purchasing agent with all his present responsibility can initiate and carry through a quality control program which involves the accumulation of standards and frequent check testing. This task is not simple but may not be as difficult as would appear on first consideration. Purchasing agents will find, as mentioned previously, standards available that can be used with little or no alteration. A plan for a more thorough inspection of products can be inaugurated which may actually reduce troubles which develop in use and result in greater economies in the long run. Buyers must be given the time to study the problem of quality more closely and make themselves more proficient in their profession.

Management should encourage buyers to take full advantage of opportunities to become better informed on the technical aspects of their purchasing function. Educational facilities should be utilized where available. Opportunities for frequent contact with manufacturing plants should be given. Acquaintance should be made with the personnel and work of independent testing laboratories, and above all, cooperation between the purchasing agent and the hospital professional staff should be encouraged. The purchasing agent must be in a position to interpret the particular requirements that a product must meet in a hospital to the vendors and to the laboratories to which testing may be referred.

It is obvious that an extensive program of laboratory testing cannot be undertaken by the average hospital. The only solution is for hospitals to combine their efforts and facilities for such a program. It should be possible for a purchasing agent to send samples of a particular shipment to a

(*Please turn to page* 314)

UNFAIR TRADE PRACTICES

Government orders prevent carrying on interstate commerce transactions that are detrimental to the public or unfair to other manufacturers and sellers

● ***By Leo T. Parker***

RECENTLY a reader wrote an interesting letter containing this inquiry: "How does the new law of "Unfair Trade Practices" affect purchasers? So many new laws have been passed lately that we do not know when we purchase merchandise from a new manufacturer whether we will be able to dispose of it. Also, how about the Federal Trade Commission, and what is the difference between its powers and the trademark infringement laws to prevent purchasers from disposing of merchandise?"

It is admitted by many law experts that it is difficult to avoid the legal pitfalls to which this reader refers. Therefore, for the benefit of readers we shall review the most important new higher court decisions which tend to simplify this subject of law.

Briefly, the Federal Trade Commission has powers under United States Statutes to prevent manufacturers and sellers from using unfair methods of competition. The Trade-Mark Act was intended to prevent manufacturers and *all* other sellers from selling merchandise having marks or names likely to deceive the buying public. Unfair competition laws restrain methods of unfair competition if a name or mark on merchandise is not involved. All of these laws and regulations relate to interstate commerce transactions although, of course, various states have enacted similar laws regulating intrastate transactions.

It is true, with certainty, that a purchaser who is so unfortunate as to purchase goods unlawful to sell, under these various laws, can do nothing but keep them or destroy them in accordance with government orders.

First, we shall review a late higher court decision which holds that ordinary trade practices are not illegal that are not detrimental to the public, or unfair to other manufacturers and sellers. Hence, without definite proof in this respect, the Federal Trade Commission cannot prosecute manufacturers, sellers or purchasers for unfair trade practices.

What Is Glass?

For example, in S. Buchsbaum & Company v. Federal Trade Commission, 160 Fed. (2d) 121, reported September, 1947, the Federal Trade Commission sued the Buchsbaum Company, which manufactured various articles made from a plasticized, pliable, and resinous material resembling glass and known as "Vinylite". The Commission alleged that this company was guilty of unfair trade practices in using the word "glass" when selling its various products under the name "Elasti-Glass".

The testimony showed that the company manufactured such things as suspenders, rain coats, garters, belts, shampoo capes, watch straps, and the like. These items are made and sold at a much cheaper price than articles made of that kind of glass in which silica is an essential ingredient. The company's products are made of plastics and are quite pliable, tensile, durable, and transparent.

The Commission contended that the word "glass" is understood by the public to mean common glass, such as that found in window panes, tumblers and bottles, and submitted to the court the testimony of ten witnesses—two housewives, a junior college student, a laundry employee, two hospital employees, an assistant of the local office of a life insurance company, an employee of the National Association of Dyers and Cleaners, a local operating manager of the National Better Business Bureau, and a writer of non-fiction articles which had appeared in such magazines as *Coronet, Cosmopolitan, The Reader's Digest,* and the *Saturday Evening Post.* All save one, after reading the company's advertisements of "Elasti-Glass", thought that the company had discovered and was using a new process by which it was able to change the nature of the glass which is found in window panes and the like, and to make it pliable, although there was nothing in such advertisements which intimated any such thing.

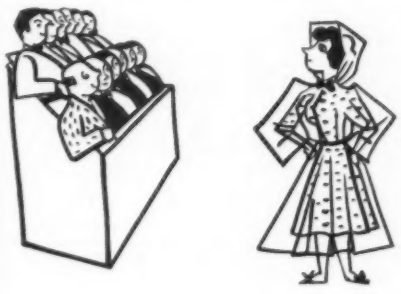
The writer of the magazine articles *assumed* that "Elasti-Glass" products were made of window pane glass in an article written for *Cosmopolitan.* Hence, it is quite apparent that a great number of persons who read advertisements published by the

company, and also many users of articles made of Elasti-Glass, assumed that the material was ordinary and common glass.

In view of this testimony the Federal Trade Commission believed that it was justified in ordering the company to cease and desist from unfair trade practices.

Trade-Name Defended

The company defended the suit filed by the Federal Trade Commission and argued that it had not violated any laws relating to unfair trade practices. The counsel for the company proved that for many years the general public had used plastic glass such as "shatter-proof glass". The court recognized the fact that this



material is a laminated glass consisting of two layers of silica glass with a layer of plastic glass between them. The middle plastic layer is the element that prevents the other layers from shattering when broken. As a unit, the three layers are known and recognized generally as "shatter-proof glass". Also, the company proved that its products are made from plastic material similar to middle layer of the "shatter-proof glass", and that it advertises and sells its products not as glass but as "Elasti-Glass" products. Also, the Federal Trade Commission failed to prove that sale of the company's products are detrimental to the public interest.

The higher court reversed the Commission and held that the company could legally use the name "Elasti-Glass" in advertising and on its products. This court held that there was no showing or proof that the public was injured by the sale of the products under the name Elasti-Glass. This court also said:

"Neither the Oxford nor any of the many American dictionaries which we have consulted limit the definitions of the word 'glass' to that made from silica, or to that from which window panes or goblets are usually made. True, the latter are perhaps the most usual forms in which we see glass."

Therefore, this higher court established new law that a trade-name or name of a product may be legally used without interference by the Federal Trade Commission if the testimony proves that (1) the public is not injured; (2) the trade-name or trade-mark does not infringe another; and (3) use of the trade-name or trade-mark does not damage the good will of other manufacturers or sellers.

Power of Commission

Section 5 (a) of United States statutes states: "Unfair methods of competition in commerce, and unfair or deceptive acts or practices in commerce, are hereby declared unlawful. The Commission is hereby empowered and directed to prevent persons, partnerships, or corporations . . . from using unfair methods of competition in commerce and unfair or deceptive acts or practices in commerce. The findings of the Commission as to the facts, if supported by evidence, shall be conclusive."

In view of the broad authority given the Commission by this statute, the courts will not reverse its order or decision unless it is clearly erroneous. And all courts agree that while the courts may approve misstatements of advertisements and statements that are not detrimental to the public with respect to ordinary products, as glass, etc., yet this same rule of law is *not* applicable to medicines, foods, or other products consumed by the public.

For instance, in Driva, Inc., v. Federal Trade Commission, 145 Fed. Rep. (2d) 976, it was disclosed that a manufacturer advertised that olive oil would prevent, or tend to prevent, appendicitis, gall stones, and bladder infections, and that it had the vitamins A, E, and F in substantial quantities.

The Federal Trade Commission ordered the company to cease and desist from issuing such advertisements of the virtues of olive oil. The higher court approved the verdict, saying:

"It has no therapeutic value whatever except as a carrier for operative drugs; and except also that it possibly has some slight value as a laxative."

Health Not Improved

According to a recent higher court, any labeling which is false and misleading when the article is introduced into interstate commerce is "misbranded" and is subject to condemnation.

For example, in United States v. Olsen, 161 Fed. Rep. (2d) 669, it was shown that a so-called Spectro-Chrome is a contrivance intended for use in the diagnosis, cure, mitigation, treatment, or prevention of disease in man. It was transported in interstate commerce.

The higher court held that the instant it was introduced into interstate commerce, its labeling was false and misleading, because its use would not materially improve the health of the user. Hence the article was misbranded, and subject to being appropriated and condemned by the government.

Separated Shipments

It has been held that products are falsely labeled if circulars or other advertising matter are shipped with the product, or in different shipments which arrive at destination about the same time. But a late higher court held that circulars shipped months *before* does not legally "accompany" the merchandise.

For example, in Alberty v. United States, 159 Fed. (2d) 278, a manufacturer shipped to a purchaser leaflets entitled *"So it's You again, is it?"* which represented and suggested that the product would be efficacious to restore color to gray hair and also to prevent hair from turning gray. The United States government filed suit

contending that the manufacturer violated the Federal Food, Drug and Cosmetic Act, by "misbranding" of the drug or product because it would not in truth restore color to gray hair and would not prevent hair from turning gray. However, since the false labels were shipped by manufacturer to the purchaser on February 7, or two months and 11 days before April 18 when the drug was shipped, the higher court held the manufacturer not liable for false labeling or misbranding. The court said:

"We do not think that the bald statement that the labels were shipped to the consignee (druggist) 71 days before the drug was shipped charges the offense of causing them to be 'accompanying' the drug's introduction into interstate commerce."

Also, see United States v. Dr. Peter's Kuriko, 158 Fed. (2d) 667, reported March, 1947. Here it was shown that government agents condemned a large number of bottles of Dr. Peter's Kuriko stating that it was misbranded when in interstate commerce. Kuriko is a medicine which has long been manufactured and sold to the public. It is a laxative and relieves functional constipation. The bottles contained a statement as follows: "Here's what may happen when you are constipated," followed by five paragraphs, entitled "Functional constipation," "Nervousness," "Flatulence," "Headaches," and "Common colds". The title of each paragraph is also in heavy black type, and opposite each is a picture of a person shown to be in misery and distress.

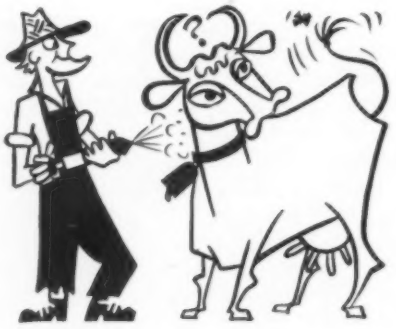
The higher court upheld the condemnation suit, saying:

"We are of the view, however, that this page of the pamphlet alone, considering the form of its arrangement, the ailments which are listed in large type and the limitation with reference thereto in small type, in connection with the pictures of persons evidently in misery and distress, furnishes the basis for a finding that the representations were misleading."

And in United States v. Olsen, 161 Fed. Rep. (2d) 669, reported August, 1947, the higher court held that the instant merchandise is introduced into interstate commerce and which has false and misleading labels, it is subject to being appropriated and condemned by the government.

Animals Fooled

Modern higher courts consistently hold that advertisements having a capacity to deceive ignorant persons may be prohibited. Also, a recent court held that the "law is not made for the protection of experts, but for the public or a vast multitude of persons who are ignorant, the unthinking and the credulous."



For example, in Oil Corporation v. Federal Trade Commission, 150 Fed. (2d) 106, reported July, 1946, the Federal Trade Commission issued an order forbidding the use of certain statements in advertising an insecticide sold in interstate commerce.

The objectionable advertising was that this insecticide manufacturer falsely represented, directly or by implication, that its product afforded complete protection to livestock from all insects, and that its use would cause milk production to increase and cows to be healthier. Another advertisement stated: "Spray kills blood-sucking flies, lice, ticks—repels stable and horn flies. One spraying lasts all day."

During the trial, all of the experts —those testifying for the manufacturer and those testifying for the Commission—agreed that a light spraying of the Livestock Spray would *not* give a cow complete protection. Not one witness placed upon the stand by the manufacturer claimed that "one spraying lasts all day". Most of them stated that the spraying gave good results under favorable conditions for some seven to nine hours and fair results for a short time thereafter.

In view of this testimony the higher court approved the order and decision given by the Commission, and said:

"The purpose of the law is the protection of the public. . . . The appraisal of the evidence and the inferences to be drawn from it are for the Commission, not the courts. . . . It may be that there was no intention to mislead and that only the careless or the incompetent could be misled. But if the Commission thinks it best to insist upon a form of advertising clear enough so that, in the words of the prophet Isaiah, 'wayfaring men, though fools, shall not err therein,' it is not for the courts to revise their judgment."

Similar Trade-Marks

According to a recent higher court no two similar trade-marks can be legally used on products in the same classification.

In Chatham v. Reserve Company, 159 Fed. (2d) 869, reported April, 1947, it was shown that a manufacturer applied for registration of its trade-mark "aluminoid".

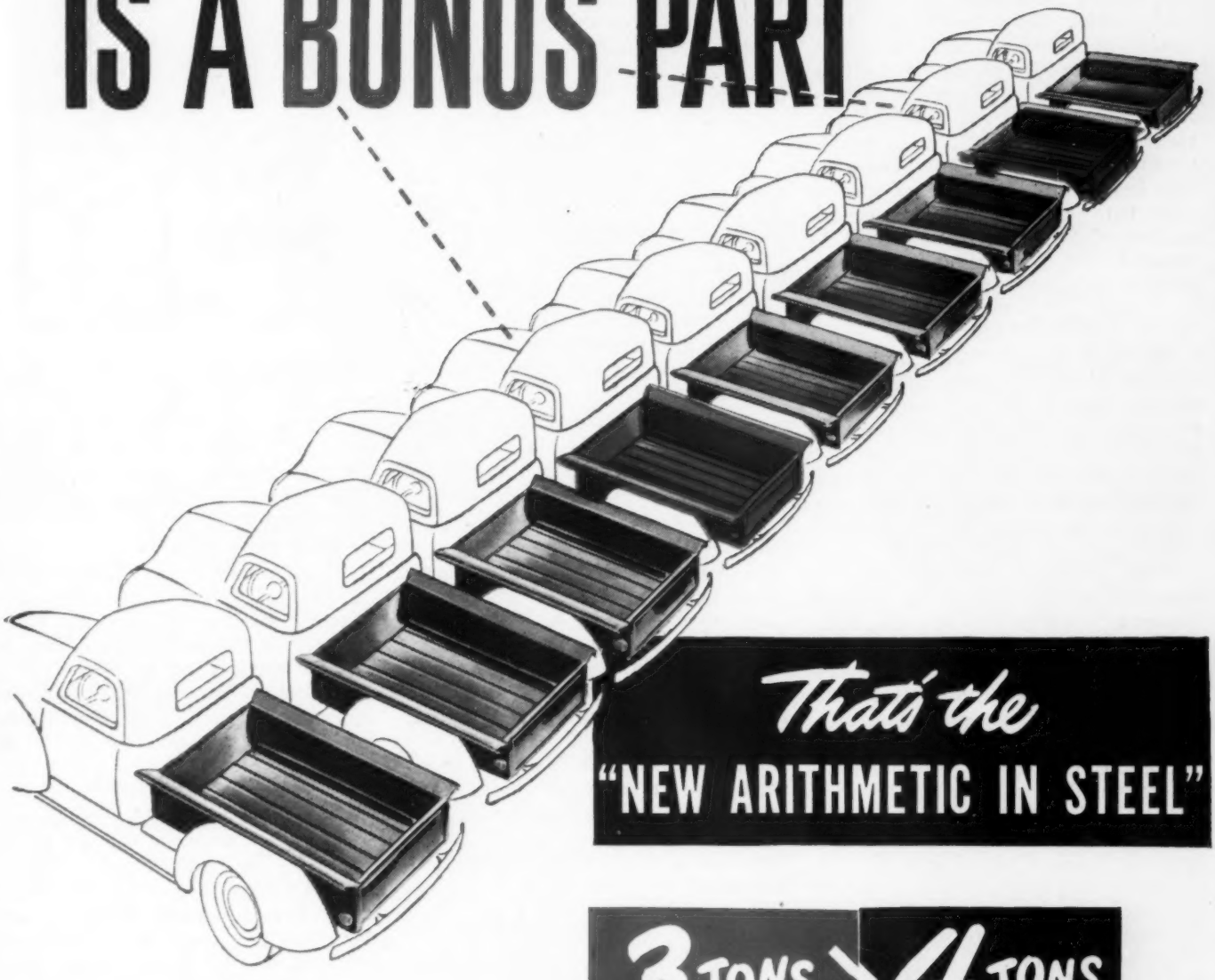
Another manufacturer had a trademark "Aloloid" used on similar merchandise.

The Court of Customs and Patent Appeals refused to register the trademark "Aluminoid" and said:

"In the instant case, the product of each of the parties is used for exactly the same purpose. Moreover, the involved goods are competitive."

Also, see Vick Chemical Company v. Nutrex Company, Inc., 159 Fed. (2d) 773. Here it was shown that a company began using the trademark "Nutrex" on a product containing vitamin B complex found concentrated in brewer's yeast extract. This court refused registration because of likelihood of confusion with another manufacturer's registered

EVERY FOURTH PART IS A BONUS PART



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trade-mark "Neutrox", as applied to dentifrice and mouth wash.

For further discussion of this law see McKesson & Robbins, Incorporated v. First Texas Chemical Manufacturing Company, C.C.P.A., Patents, 159 F. (2d) 770, where the court discussed at great length the question of the likelihood of confusion arising from identical or similar trade-marks. This court held that confusion would be likely to result from the concurrent use of the two marks upon the same general respective medical goods, and held that the trade-mark "Ora-Cel", used on a vitamin preparation was *not* registerable because of likelihood of confusion with a previously registered trade-mark "Ora" used for a deodorant and "Oraform" used for throat-pastils. This court said:

Priority of Use

"It may be that there are many articles sold in drug stores or by the manufacturers of pharmaceuticals, medicinals and chemicals that differ so widely in their essential characteristics as not to be of the same descriptive properties, but it has become the settled policy of the law to resolve doubts *against* the newcomer."

For comparison, see Ciba Pharmaceutical Products, Inc., v. Abbott Laboratories, 121 F. (2d) 551, 553, 28 C.C.P.A., Patents, 1315. Here the higher court held that the trade-marks "Dical-D," used on "medicinal wafers containing dicalcium phosphate and viosterol," recommended and used for dietary deficiencies, was *not* confusingly similar with the trade-marks "Dial-Ciba" and "Dial" used on a pharmaceutical product—a dormitive and a sedative. This court said:

"It is clear that there is a *per se* difference between the goods of the respective parties as to their inherent characteristics and, of course, as to their uses. The fact that both are medicinal in character and have a therapeutic effect upon users of necessity makes carefulness in selection imperative on the part of prudent purchasers."

Also, see Chicago Company v. Bendix Corporation, 157 Fed. (2) 201, reported January, 1947. Here the testimony showed that a manufacturer registered a trade-mark "Pneudraulic" for *airplane parts*. Another company applied for registration of the same trade-mark on *hydraulic riveters*. The higher court approved registration of this mark, because the only similarity in the two products is that both must have use of pneumatic and hydraulic power in order to be operated and utilized.

According to a recent higher court two manufacturers who sell their merchandise in the same territory may register and use the *identical* trade-mark on goods in different classifications. For instance, one court held that no one would be deceived into believing that a can of oil and a can of peas were distributed by the same manufacturer, although both products has exactly the same trade-mark. See also Application of B. F. Goodrich Company, 52 App. D. C. 261, 285 F. 995.

Law Varied

On the other hand, in Three in One Oil Company v. St. Louis Rubber Cement Company, Inc., 87 Fed. (2d) 479, the court held that lubricating oil and cement used for gluing rubber, cloth and leather are goods of the *same* descriptive properties. Hence these two manufacturers could *not* use the same or similar mark on their products.

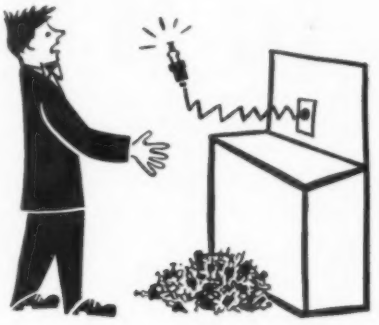
An interesting case is Wall v. Rolls-Royce, 4 Fed. (2d) 333, where the court held that confusion would result from a manufacturer labeling his radio tubes "Rolls-Royce". The court said:

"Upon no other theory than a purposed appropriation to himself, and intent to convey to the public a false impression of some supposed connection with the Rolls-Royce industries, can Wall's actions and advertisements be explained. . . . It is true those companies made automobiles and aeroplanes, and Wall sold radio tubes, and no one could think, when he bought a radio tube, he was buying an automobile or an aeroplane. But that is not the test and gist of this case."

Reason for Trade-Mark Law

The higher courts consistently hold that a trade-mark gives its owner *only* the right to prohibit the use of it by others to protect his good will. Hence, when a mark is used in a way that does not deceive the public, it is legal.

In Champion Spark Plug Company v. Sanders, 67 S. Ct. 1136, reported July, 1947, the Supreme Court of the United States finally decided that a company which reconditions second hand automobile accessories may use the original trade-mark. The testimony showed facts, as follows: The Perfect Recondition Spark Plug Company was engaged in the business of collecting used spark plugs, repairing and reconditioning them. This company retained the word "Champion" on the repaired or reconditioned plugs. The outside box or carton in which the plugs are packed has stamped on it the word "Champion," together with the letter and figure denoting the particular style or type. They also have printed on them "Perfect Process Spark Plugs Guaranteed Dependable" and "Perfect Process Renewed Spark Plugs."



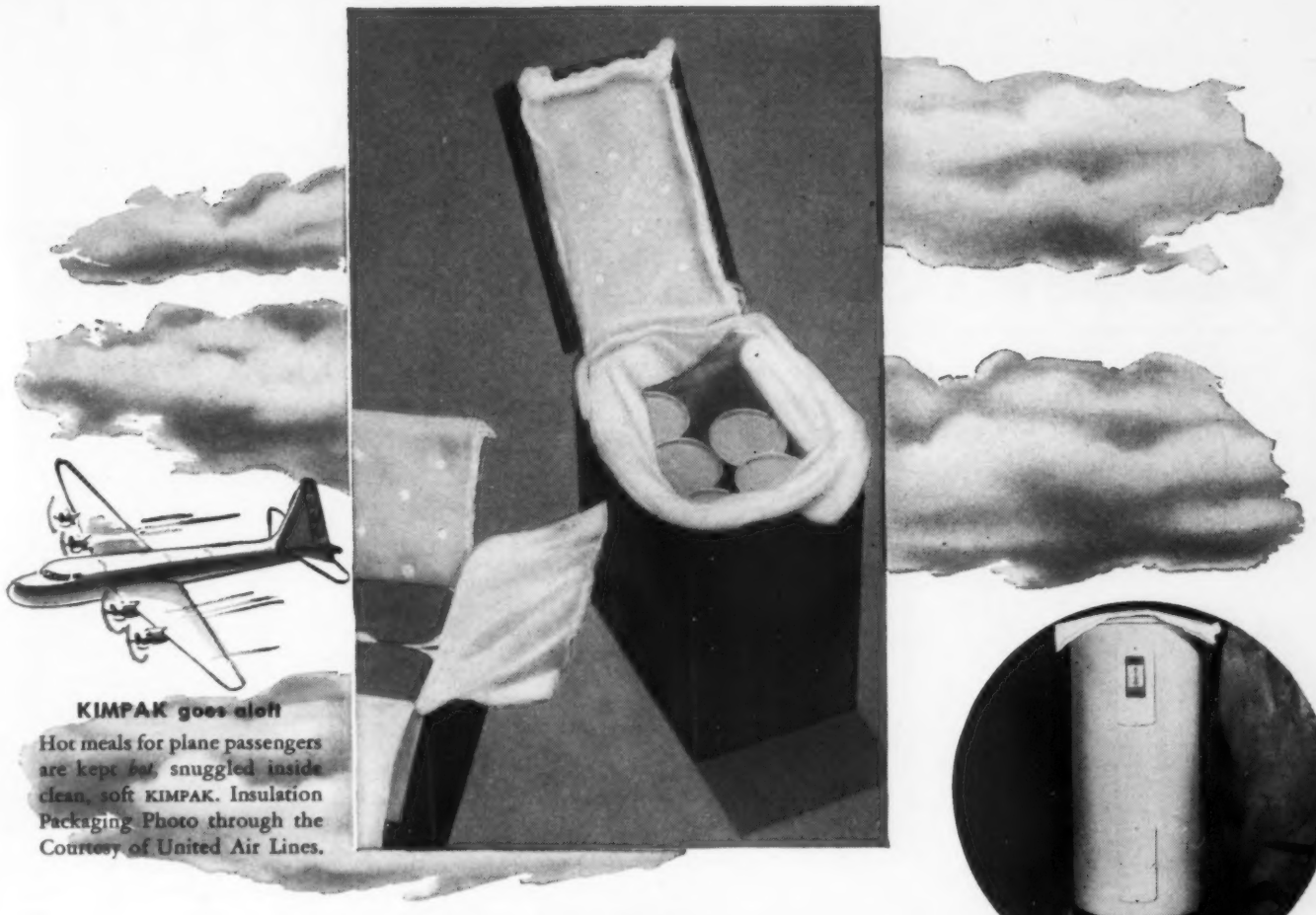
The Champion Spark Plug Company filed suit against the reconditioning company and asked the court to grant an injunction to compel the latter company to remove the trade-mark "Champion" from the spark plugs before selling them, after the reconditioning process.

The Supreme Court of the United States held that the reconditioning company could recondition the plugs and retain the name Champion on them, but this court ordered the reconditioning company to stamp the reconditioned plugs to show that they are repaired or used.

Second-hand Goods

This court also held that the reconditioning company will be guilty of unfair competition and infringement if it fails to have the word "Repaired" or "Used" stamped and baked on the plugs by an electrical hot press in a contrasting color. Also, the court held that the containers used to pack the plugs must have printed thereon the name of Perfect Recondition Spark Plug Company, and that the plugs are reconditioned used plugs. This court said:

"We are dealing here with second-hand goods. . . The repair or reconditioning of the plugs does not give them a new design. It is no more than a restoration, so far as possible, of their original condition. . . Here there has been no showing of fraud or palming off. . . Inferiority is immaterial so long as the article is clearly and distinctively sold as repaired or reconditioned rather than as new. The result is, of course, that the second-hand dealer gets some advantage from the trade-mark."



KIMPAK goes aloft

Hot meals for plane passengers are kept *hot*, snuggled inside clean, soft KIMPAK. Insulation Packaging. Photo through the Courtesy of United Air Lines.

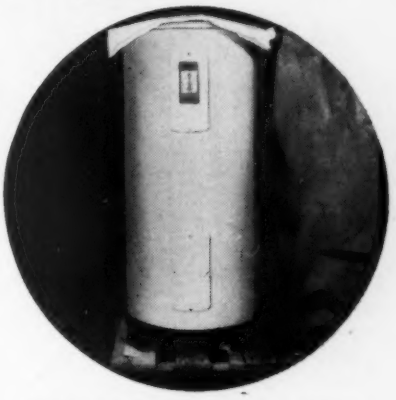
Kimpak Float Packaging*

protects every product you ship

Wrap your products in strong, cushiony KIMPAK* creped wadding . . . and off they go to market—*safely*. For dependable KIMPAK clothes any product with complete protection—from shipping room to destination.

KIMPAK is soft, clean and good-looking—increases the eye-appeal of any package. It is pleasant to handle and economical. Feather-light and flexible, it adds little weight or bulk to shipments. Highly resilient, it withstands continuous shock and vibration without impairing its efficiency.

KIMPAK is made either liquid absorbent or liquid repellent. It is available in a variety of types, thicknesses and backings to suit your particular interior packaging needs. There is a specification of KIMPAK to meet every requirement of the Four Basic Methods of Interior Packaging—Surface Protection, Blocking and Bracing, Flotation Packaging and Absorbent Packaging.



Surface Protection—Water Heater Photo Courtesy Hotpoint Inc.

Blocking and Bracing—Metal Window Frames. Photo Courtesy Flour City Ornamental Iron Company.

Visit our booth, 17th AMA Packaging Exposition, Cleveland Auditorium, April 26-30, 1948

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Creped Wadding Division, Neenah, Wis.

Please send me the free KIMPAK booklet on better ways to package our product. P-348

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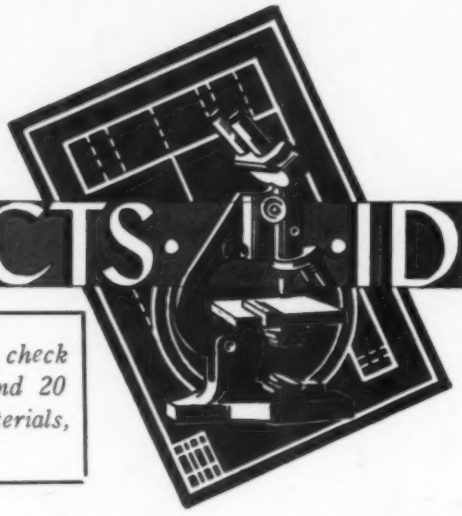
New PRODUCTS · IDEAS



Purchasing Agents and their Assistants are invited to check the pre-paid "Ask Purch" postcards on Pages 19 and 20 for late catalogs and bulletins on New Products, Materials, Finishes, Equipment, etc.

WIRE ROPE HOIST

LOW-capacity wire rope hoist known as the "Load King" is available in ¼, ½, and 1-ton capacities. The frame of the portable hoist is heavy, one-piece, ribbed-steel casting, constructed for use with lug, plain trolley, motor trolley, or winch-type mounting. Large diameter drum has machine-cut grooves for guiding the cable as it winds. Bulletin P-1048 available. *Yale & Towne Mfg. Co., Philadelphia Division, 4530 Tacony St., Philadelphia, Pa.*

PASTEL COLORED ALUMINUM TILE

MURALUX Jewel-Tone tile is colored aluminum in pastel shades for interior decorative effects. The color is dyed into the metal, according to manufacturer. The tile is said to reflect as high as 85% of the light without glare, and to be rust proof, peel proof, chip proof, craze proof, and steam proof. It is made from pure aluminum, cold treated for hardness. *Guild Products, 211-13 W. Market St., Sandusky, O.*

MARKING MACHINE

MULTI-lever spring tension pressure marking machine for marking tapered or beveled parts, or cutlery, is designated Model No. 13. The machine is constructed for mounting on a work bench. It marks the word "stainless" in 3/64" size lettering, or names in one or more lines of larger or smaller size letters or design, into finished blades by means of a roller die. The machine is 14" high x 6" wide (including the blade holder) x 20" deep. Further details available. *The Acromark Co., 384 Morrell St., Elizabeth, N. J.*

HAND TORCH FOR CUTTING STAINLESS STEEL

STYLE 9016 hand torch for cutting stainless steel, using Airco flux-injection process, is 21" in length and comes with a 90-degree torch head. Features include: monel metal head; stainless steel tubes; stainless steel lever and ribbed handle; remote control cut-off; uses standard cutting tips. The torch is also available in a 36" length. Because of similarity to Airco series 9000, standard parts will often be adaptable in torch repair, minimizing maintenance costs, according to manufacturer. *Air Reduction Sales Co., 60 E. 42nd St., New York 17, N. Y.*

INDUSTRIAL AIR COMPRESSOR

MODEL TX-8 air compressor, suitable for use in industrial plants, is available in piston displacements from 4.6 cu. ft. to 8.6 cu. ft., furnishing an operating pressure of 70 to 80 lbs. Power is supplied by gasoline engine or electric motor. Entire unit is mounted on structural steel frame with two 10" wheels equipped with zero pressure tires. Handle is detachable. Further information available. *Quincy Compressor Co., Quincy, Ill.*

COTTON RUBBER-LINED FIRE HOSE

LIGHTweight rubber-lined fire hose, marketed under the name Qua-Flex, is said to be extremely strong and flexible. According to the manufacturer, tests have proved that the hose withstands pressures up to 300 psi. The hose is constructed to fold flatly, making it adaptable for storage on all types of racks, even those designed for unlined linen hose. Hose is protected by a jacket woven of long staple cotton. It is said to be easily dried and to be leak proof. *Quaker Rubber Corp., Philadelphia 24, Pa.*

SPLINE AND GEAR GRINDER

THIS spline and gear grinder is described as a highly precise semi-automatic machine tool which produces fine-pitch gears and splines to exceedingly close tolerances. Net clearance from the center line of the work arbor to the surface of the table is 4¼". Distance between centers will accommodate an 8" arbor. Automatic indexing is provided at the end of each stroke. All mechanisms are guarded against damage from grinding-wheel grit. *Taft-Peirce Mfg. Co., Woonsocket, R. I.*

COATING COMPOUND FOR SPRAY BOOTHS

TRIAD PRD coating compound for use on the walls of paint spray booths is a light-colored, semi-liquid material that is applied with a brush or spray gun. The coating of the compound dries and forms a continuous white coating to which paint overspray adheres. When cleaning booth, coating is readily scraped off without previous soaking, or can be removed by flushing with either hot or cold water. *Detrex Corp., Box 501, Detroit 32, Mich.*

PORTABLE DRILL PRESS

LIGHT, portable drill press for fine work is powered by a No. 2 Moto-Tool which attains a speed of approximately 27,000 rpm. The power unit can be raised, lowered, swung in any direction, or quickly removed for regular off-hand use. Work is brought to the drill on a 3¼" table having a 1⅜" stroke. Table stop is adjustable, having a screw which acts as a depthgauge for fine control. The complete drill press is 12" high, 6¾" long, 4" wide. *Dremel Manufacturing Co., Racine, Wis.*

(*Please turn to page* 152)

How to get your money's worth when you buy Fluorescent Lamps

WHAT'S THE DIFFERENCE?

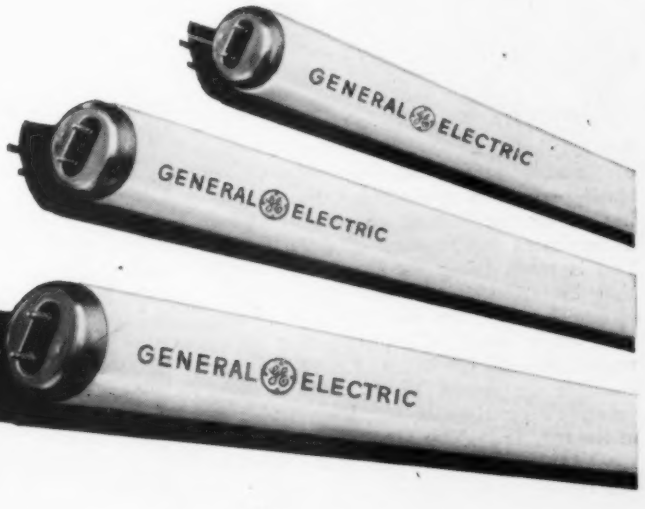
Most fluorescent lamps look alike. But it takes more than a glance to compare quality. Fluorescent value involves many factors—initial light output, maintenance of light, dependability, uniformity, efficiency, physical correctness, color, lamp life.

THE EASY WAY TO RECOGNIZE FLUORESCENT VALUE

Fortunately, you don't have to be a technical man to get your money's worth when you buy fluorescent lamps. Just insist on the G-E monogram. It's a safe, sure guide to *balanced lamp performance*, because General Electric research works constantly to make G-E fluorescent lamps ever better and to make them Stay Brighter Longer.

SEND FOR THIS FREE BOOKLET

Here's a quick, interesting way to get the facts you should know to get the most from your lighting investment. This book tells you specifically why "G-E" means top quality in fluorescent lamps. Ask your nearby G-E Lamp office for a copy of Booklet Y-681. Or write to General Electric, Dept. 166-P-12, Nela Park Cleveland 12, Ohio.



G·E LAMPS

GENERAL ELECTRIC

FULL-FLOATING HOLDER

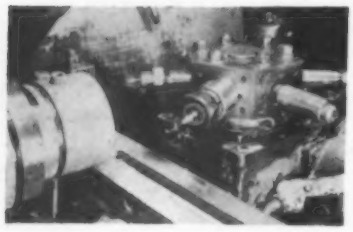


ILLUSTRATION shows Erickson full-floating holder designed to hold taps and reamers for precision operations. Parallel and angular misalignment is prevented by the use of a Neoprene insert and floating ball-and-socket joint, which permits the tool to align itself properly with the center line of the spindle. Standard Erickson No. 400 series collets are employed with a unique range of 1" to ⅛" in increments of 1/32". The hold can be made to fit other series of Erickson standard collets. *Erickson Tools Division, 2309 Hamilton Ave., Cleveland 14, O.*

EXTRUDED VINYL TUBING FOR 150 C

NATVAR #400 extruded vinyl tubing has been approved by Underwriters' Laboratories for continuous operating temperatures of 105 C. Its use in electrical and electronics equipment manufacturing where coated fabric sleeving and tubing were heretofore necessary is said to result in savings in material, labor and waste. It is described as being suitable where the operating conditions call for both oil resistance and high heat resistance. *The National Varnished Products Corp., Woodbridge, N. J.*

TUNNEL KILN

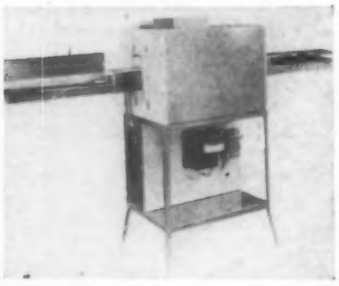


ILLUSTRATION shows tunnel kiln for small batch production work, firing of ceramic parts, and heat treating of small parts on a production basis. Featuring an electric heating element providing a maximum temperature of 2200 F, the kiln is made ready for immediate operation by attaching the line to the fused switch box in the unit. It is a pusher type, with small refractory trays being pushed through the inside of the 33" firing chamber by means of a variable speed drive. Firing zone is 10" long, and size of the tray is 2⅝" by 3¾". *K. H. Huppert Co., 6830 Cottage Grove Ave., Chicago 37, Ill.*

10-AMPERE SILENT MERCURY SWITCH

G-E silent mercury switch with a 10-ampere T-rating at 125 volts replaces the company's 5-ampere switch. The 10-ampere rating makes the new model equal in interrupting capacity to the best specification switches, according to the manufacturer, and opens new fields for its use. The switch has been tested for a half-million "makes and brakes", it is claimed. The switch is equipped with a new handle available in either ivory or brown plastic. *Appliance & Merchandise Dept., General Electric Co., Bridgeport, Conn.*

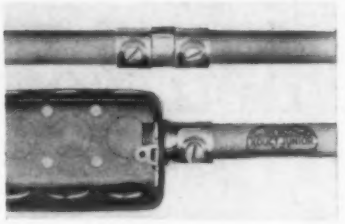
NEW TYPE FREIGHT CLEAT

THE Peyton Spur Cleat has been designed to help reduce freight loss and damage. It may be used to supplant wooden cleats. As indicated by the illustration it may be nailed on either of its angles, and spurs on bottom driven into holding surface. They may be used as hold down, reinforcing, pocket, back-up cleats—chock blocks and side blocks. Cleat is claimed to positively anchor shipments, and will not loosen incident to rough handling of car. They may be used to secure boxes, barrels and any time of container or palletized load, and for bracing bulkheads or gates. Cleats are furnished in angle type illustrated, knee brace type, and special types. Stock sizes, 2" x 3"; 3" x 3"; 3" x 4"; and 4" x 6". Special sizes available. *The National Dunnage Co., 5715 Hudson St., Dallas, Tex.*

DECORATIVE PLYWOOD OF IMPORTED WOOD

LIGHT colored decorative plywood, designated Korina, is manufactured from imported wood, and ranges from a striped effect to a highly figured variety. Logs used in its manufacture were found to be so free of defect that sheets of veneers more uniform than prima vera weldwood were possible, according to the manufacturer. The plywood is manufactured in ¼" and ¾" thicknesses in sizes 48 x 72, 48 x 84, 48 x 96 panels, and in counterfronts 144 x 36, and 144 x 38 panels. *United States Plywood Corp., 55 W. 44th St., New York 18, N. Y.*

CONNECTORS & COUPLINGS



PRESSED steel connectors and couplings designed for use with electrical metallic tubing are said to be easy to inspect and advantageous for use in close quarters and corner installations. The E. M. T. coupling shown at top of illustration slips over thinwall tubing ends in a close, accurate fit. Typical installation of the E.M.T. connector is also shown. Gripping is secured by the action of an embedding screw working through a boss. When the screw is driven down to rest on the boss, the tip of the screw becomes embedded in the tubing wall. *National Electric Products Corp., Chamber of Commerce Bldg., Pittsbridge, N. J.*

NEW SYNTHETIC RUBBER MATERIAL

FEL-PRO 131 is a new synthetic rubber material for use in operations employing rubber or rubberized sealing materials or parts. Tests are said to reveal: 1,800 psi tensile strength; 400% plus ultimate elongation; 2% maximum swell in A.S.T.M. fuels and oils; high temperature resistance (300 F—hot oil); flexibility retained with no cracking at minus 55 F; resistance to abrasion and no surface deterioration on aging; and a Durometer hardness (Shore "A" type) up to plus or minus 5. Samples available. *Felt Products Manufacturing Co., 1504 Carroll Ave., Chicago 7, Ill.*

IMPACT NUT SETTER

LIGHTWEIGHT, high-speed, portable electric impact nut setter is said to be torqueless—it will not twist in operator's hands when nut becomes tightened. It drives nut or bolt 1750 rpm at free speed. At point of resistance, impact unit automatically delivers 3,000 impact blows per minute. The unit is reversible for removing nuts or bolts. Operates on any 110 volt, 60-cycle, a-c or d-c circuit. Overall length, 12½", weight 13½ lbs. Capacity up to ¾" nuts and bolts. Literature available. *Illinois Gage & Mfg. Co., 4639 W. Washington Blvd., Chicago 44, Ill.*

(*Please turn to page* 154)

WHY FABRICATORS LIKE YOLOY-YOUNGSTOWN'S HIGH-TENSILE STEEL

Yoloy is Easy to Weld

YOUNGSTOWN'S Yoloy is a high-tensile steel that can be welded as readily as most carbon steels of the same carbon and manganese content.

Yoloy is a high-tensile low alloy nickel copper steel deriving its greater physical properties from a balanced combination of chemical elements which reduce air hardening to a minimum.

This easy welding property of Yoloy has been demonstrated in hundreds of applications. Fabricators and welding engineers frequently praise the strong, safe, ductile, easy-to-make welds they obtain on Yoloy steel.

In addition to its ease of welding and greater strength, Yoloy is ductile, has more impact strength and has superior ability to resist corrosion and abrasion making it an ideal steel for that tough job where weight saving without loss of strength or service life is required.

Yoloy steel is available in the form of sheets, plates, strip, bars and tubular products. For further information just phone the Youngstown district sales office which serves you.

YOUNGSTOWN

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GENERAL OFFICES - YOUNGSTOWN 1, OHIO

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Manufacturers of

CARBON - ALLOY AND YOLOY STEELS

QUALITY YOUNGSTOWN SERVICE

Sheets-Plates-Pipe and Tubular Products-Bars-Rods-Wire-Cold Drawn Carbon Steel Rounds-Tie Plates and Spikes-Conduit - Electrolytic Tin Plate - Coke Tin Plate.

WIREBOUND CRATE (above) Strong, lightweight, has interior support fixtures. Easy handling, stacks well. Supplied flat for wrap-around assembly

ALL-BOUND BOX (left) Same strength and utility. Shaped to fit product. Wood veneer panels wirebound for protection against weather, dirt.

FIBREBOARD BOX (right) Economical, efficient. Fully enclosed with fibreboard panels, steel stapled to wood cleats. Interior reinforcements. Supplied flat.

NAILED WOOD BOX (below) Material, workmanship to meet or surpass Gov't Specifications for domestic or export.

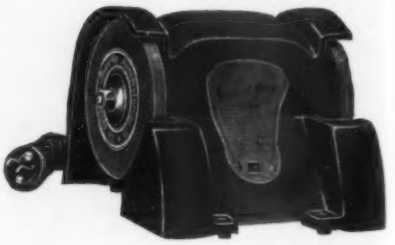
Engineered
for trouble-free shipments anywhere!

You can *try* before you *buy!* Prove to yourself the many advantages of the American way to prepare your products for shipment . . . and no obligation. We'll fit your product into a specially made-up, sample packing, *engineered* for the utmost in protection at the lowest cost, and return it to you with our estimate. Send us your material and specifications today. Complete details promptly at your request.

THE *American* BOX COMPANY

Est. 1901 • **1901 W. 3rd Street • Phone: MAin 4221 • Cleveland 13, Ohio**
Branch Plant: Marion, S. C.

PORTABLE BENCH GRINDER



ELECTRIC portable bench grinder for light grinding, sharpening, surfacing, deburring and buffing has a one-piece housing of the permanent-mold type. Known as the Speedway No. 117, it has an a-c motor with more than 3 times the power of the pre-war model. Two 4½" wheels and the motor are enclosed in the housing which is finished in blue crackle. The grinder weighs 7½ lbs. and is rated at 1/15 hp. *Speedway Mfg. Co., 1834 So. 52nd Ave., Cicero 50, Ill.*

GENERATOR PRODUCES GAS FROM FUEL OIL

COMPACT unit known as the Vapofier is said to produce safe low-cost gas from fuel oil for all types of industrial ovens and furnaces. It is claimed to make a quick switchover to gas without interruption of flame or change of flame quality, and users are said to report fuel savings up to 50% over manufactured gas. It automatically maintains constant manifold pressure and air-gas ratios from a reducing to an oxidizing flame. *Vapofier Corp., 10316 South Throop St., Chicago 43, Ill.*

FRICTION ROLL FEED

AUTOMATIC friction roll feed is designed for Benchmaster presses and a majority of standard punch presses. It may be used with metal, wood, plastic, cardboard and felt. Features include: friction drive geared down to give 0 to 3" adjustment in feed; will take stock in thousandths is taken up by a spring-up to 3" in width; adjustment for different thicknesses of stock from 0 to 3/16" loaded housing; height adjustment, 0 to 2¼"; machine can be operated at full speed of 285 per minute. *Benchmaster Manufacturing Co., 2952 West Pico Blvd., Los Angles 6, Calif.*

SAWS FOR CUTTING LAMINATED PLASTICS

CARBIDE - tipped saws for precision cutting of laminated plastics are hollow-ground, or dished in below the teeth, providing the necessary clearance normally obtained by "setting" the teeth on the blade. The teeth are ground flush

(*Please turn to page* 156)

Visit the STARRETT Exhibit
BOOTH No. 217
Tool Engineers'
Industrial Exposition
Cleveland, Ohio, March 15-19

STARRETT TOOLS

Winning Combination

"HANDS" by Robert Comport is a prize-winning photographic study selected for excellence of detail. A stickler for accuracy, Mr. Comport chose as his model a craftsman whose sensitive hands reflect years of painstaking labor on precision work. And to complete the picture, he chose Starrett Tools—the tools skilled craftsmen use. Shown in the photographic study are: Starrett Micrometer No. 230 and Starrett Telescoping Gage No. 229.

STARRETT

PRECISION TOOLS • DIAL INDICATORS
STEEL TAPES • GROUND FLAT STOCK
HACKSAWS • BAND SAWS FOR CUTTING
METAL, WOOD, PLASTICS

Buy Through Your Distributor

THE L. S. STARRETT CO. · *World's Greatest Toolmakers* · **ATHOL, MASSACHUSETTS, U. S. A.**

3 TIMES THE LIFE

of ordinary magnet chain!

TAYLOR MADE
TRIPLE MAGNET CHAIN

HERE IS THE REASON WHY!

A 60-degree twist in two of the three connecting links keeps all links of legs perpendicular to each other—a patented feature that eliminates wear.

CONVENTIONAL
TRIPLE MAGNET CHAIN

TAYLOR MADE Triple Magnet Alloy Chain stays on the job two to three times longer than conventional magnet chain. This improved chain eliminates twisting and kinking... the cause of excessive wear in ordinary magnet chain. It is built of TAYLOR MADE Alloy Steel Chain to give greater resistance to shock... grain growth and work-hardness—eliminating periodic heat treatment.

Such safety and economy has never before been available to users of magnet chain. This T M chain is a real contribution to material handling. Write the factory for more details.

S. G. TAYLOR CHAIN COMPANY
DEPT. P-3, BOX 509, HAMMOND, INDIANA

TAYLOR MADE Chain

"THE BEST BY TEST SINCE 1873."

(*Continued from page* 154)

with the body of the saw, permitting a substantial reduction in the kerf of the saw and allowing it to travel more easily through the material, and reducing the amount of material waste. Alternate bevel design is said to produce smooth cuts and close tolerances. Available in diameters from 8" to 14". *DeLuxe Saw & Tool Co., 2476 Blue Island Ave., Chicago 8, Ill.*

LIFTING AND DUMPING MACHINE

ILLUSTRATION shows Cesco dumper which can be used for lifting and dumping quantities of liquids, solids and semi-solids. The material is placed in the skip of the dumper, a switch is turned and the skip is automatically lifted and emptied into bins or other receptacles. The dumper has a 500 lb. capacity box type skip for loose materials or liquids, or an open front skip for bagged materials. It is built in 5, 6, 7 and 9 ft. dumping heights, and occupies 36" x 65" floor space. Literature available. *Colson Equipment & Supply Co., Dept. P-1, 1317 Willow St., Los Angeles 13, Calif.*

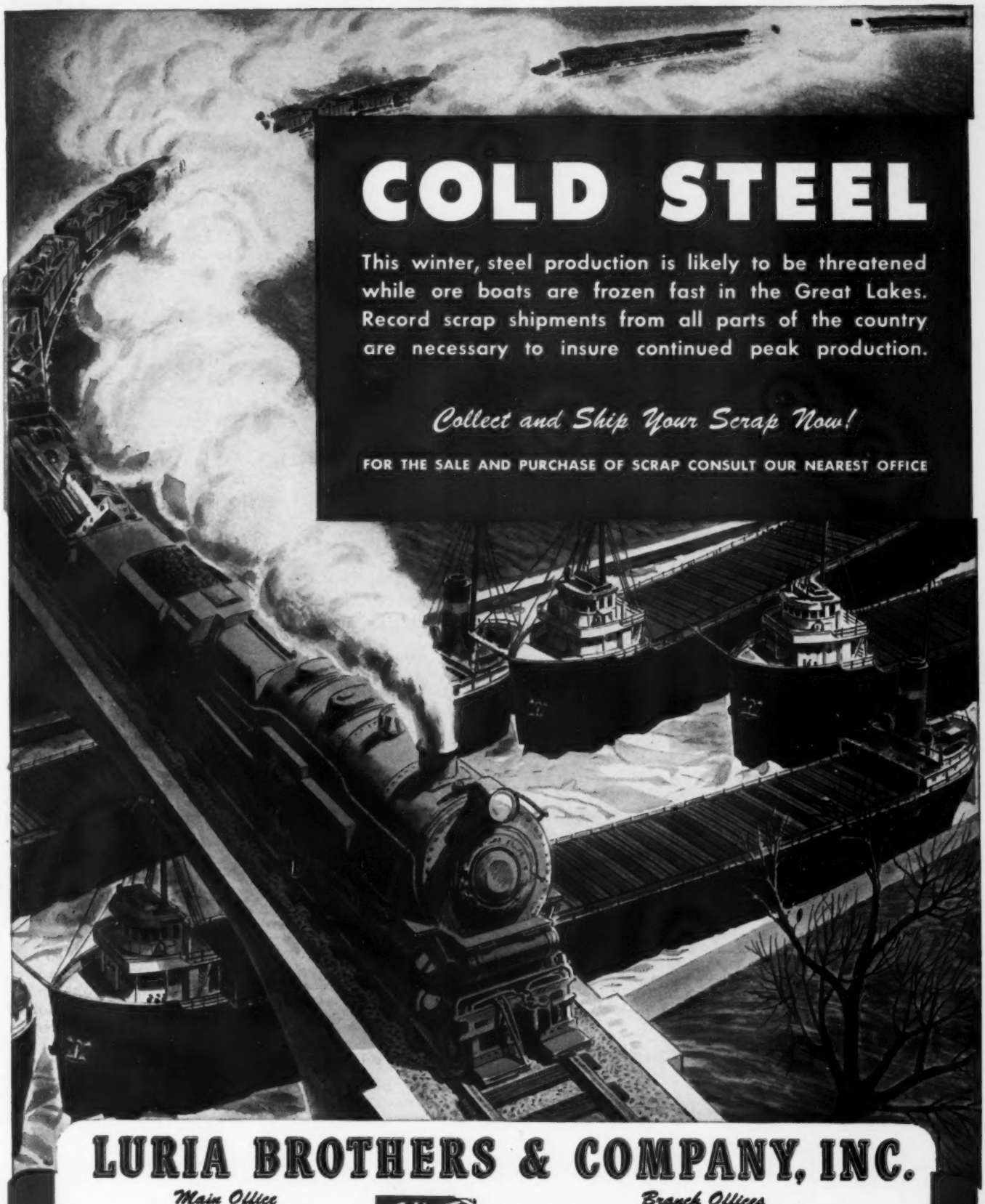
FLUX FOR GAS WELDING OF STAINLESS STEELS

AIRCO Formula #34 is described as a flux specifically compounded to dissolve the chromium oxides encountered in welding stainless steel and other high chromium bearing alloys. Application by painting the immediate and surrounding surfaces to be welded protects the molten metal from the air, thus preventing oxidation, it is said. The flux has proved superior to any previous stainless steel yelding flux they have put on the market, manufacturer states. *Air Reduction Sales Co., 60 E. 42nd St., New York 17, N. Y.*

VIBRATION CONTROL UNIT

TYPE RS conical rubber spring mounting is a vibration control unit with a load capacity ranging from 25 to 125 lbs. per unit. The conical spring design is claimed to provide greater horizontal stability than conventional all-rubber mountings, giving smoother operation, and frequently eliminating necessity for snubbers or flexible connections. It is said to have wide frequency range for successful isolation, and is effective for pumps operating at 1750 rpm, as well as compressors running at 450 rpm. Bulletin available. *The Korfund Co., Inc., 48-82 Thirty-Second Place, Long Island City 1, N. Y.*

(*Please turn to page* 158)



COLD STEEL

This winter, steel production is likely to be threatened while ore boats are frozen fast in the Great Lakes. Record scrap shipments from all parts of the country are necessary to insure continued peak production.

Collect and Ship Your Scrap Now!

FOR THE SALE AND PURCHASE OF SCRAP CONSULT OUR NEAREST OFFICE

LURIA BROTHERS & COMPANY, INC.

Main Office

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LEADERS IN IRON AND STEEL SCRAP SINCE 1889

MATERIAL HANDLING News

You'll appreciate why Clark Electric Battery-Powered Fork Trucks enjoy an extraordinary leadership when you consider these basic advantages:

1. **Clark manufactures its own major units**
2. **Clark enjoys the benefit of assembly line production**
3. **Clark provides maximum interchangeability of parts**

Among industrial executives who *know operating costs* of electric fork trucks—taking into consideration initial investment, maintenance cost and operating cost—Clark electric fork trucks are preferred by a generous margin.

These men's opinions may be summarized in the terse comment of one of them—"Clarks cost less!"

1. VOLUME MANUFACTURE EFFECTS BIG SAVINGS

It is a fact scarcely in need of emphasis to production men that the volume manufacture of Clark machines achieves many important economies. Practically all the major units in Clark machines are produced in Clark's own plants, and on a mass scale—axles, transmissions, wheels, frames and smaller units. All these units must meet the exacting standards established for Clark Products. All possess that rugged excellence that has built the Clark reputation for fine engineering.

Economical assembly saves dollars for customers. Here electrical control gets final inspection.

2. ASSEMBLY-LINE ECONOMIES

A further benefit passed along to users of Clark machines derives from Clark's assembly-line production. Inasmuch as Clark builds both types of fork truck—electric battery-powered and gas-powered—Clark's output is by far the largest in the industry.

Here is electric battery power in fast, maneuverable form — instantly applicable to countless routine assignments.

3. INTERCHANGEABLE PARTS

A third potent advantage springs from the maximum interchangeability of parts perfected by Clark. Insofar as is possible, parts used in electric trucks are identical with similar parts of gas powered trucks—a source of important savings to Clark users.

The fact that "Clark builds both" is worthy of repetition, and you realize why. Clark's recommendations are unbiased. You get wholly objective counsel concerning your operations and the types of machines that will serve you most efficiently and economically. Here, indeed, is a good recommendation!—CONSULT CLARK.

How to cut handling costs "to the bone"—in one easy picture-lesson.

CLARK GAS AND ELECTRIC POWERED FORK TRUCKS AND INDUSTRIAL TOWING TRACTORS

CLARK EQUIPMENT COMPANY, TRUCTRACTOR DIVISION, BATTLE CREEK 23, MICH.
REPRESENTATIVES IN PRINCIPAL CITIES THROUGHOUT THE WORLD

QUICK-DRYING LINE MARKING PAINT

LONG wear, easy application, and economy are features claimed for Porcelite Traffic Zoning paint. It is said to dry in 20 to 30 minutes, to hold color and visibility for a long time, and to give unusual resistance to stains and scuffing—withstanding all types of traffic up to the heaviest machine load. One coat, applied by hand or machine, does the job, it is said. Special non-bleeding primer furnished for creosote block. *Industrial Sales Division, Thomson Porcelite Paint Co., 829 North Third St., Philadelphia 23, Pa.*

SCREWDRIVER, HOLDER AND ALIGNER

SLICK 3-11 screwdriver termed a timesaver, combines the features of a screw holder, aligner and screwdriver. The driver has inverted and flexible bits, allowing screws to be started at an angle. The driver tube acts as a chuck on round and flat screw heads. As pressure is applied, the screw is aligned with and becomes almost an integral part of the driver, eliminating wobble. Driver bits stay in the screw slots and make for safety. Spring mechanism behind the bits forms a flexible connection between screw and hand. Literature available. *Eslick Products, Inc., 1312 Hawthorne Rd., Grosse Pointe Woods 30, Mich.*

IMPROVED CHIPPING HAMMER CONSTRUCTION

HAND forged heads on Atlas chipping hammers are drilled half way through and the handles silver brazed into the hole. The end of the handle is machined to fit the base of the drilled hole so that the silver flows, cementing the handle to the head, over the entire surface of the hole. In tests, according to the maker, the head has been

(*Please turn to page* 160)

When the Order is for Portable Electric or Pneumatic Tools

Order SKIL Tools

● They're quality-built for long-run economy. They're the choice of workmen everywhere who know power, speed, perfect balance and handling ease. No finer tools than SKIL Tools are made . . . you can order them with full confidence.

Drive Down Costs on Assembly Jobs with SKIL* Drivers for driving screws or running nuts

Model "304" SKIL Driver positive clutch. Operator determines point of disengagement by releasing pressure at his judgment.

Model "203" SKIL Driver has adjustable clutch that disengages on predetermined torque. It takes only seconds to adjust tool for proper tension.

Whatever you're assembling . . . whether the parts are of wood, metal or composition, you'll speed up the job with SKIL Drivers that drive machine and wood screws up to ⅛ in., self-tapping screws up to No. 12. These SKIL Drivers are light in weight, compact, perfectly balanced for easy handling in any position in close quarters. See more detailed descriptions at the right and call your SKIL Tool Distributor today for a convincing demonstration.

SKILSAW, INC.
5033 Elston Ave., Chicago 30, Ill.
Factory Branches in Principal Cities
In Canada: SKILTOOLS, LTD., 66 Portland St., Toronto, Ont.

*SKIL is a Trade Mark of SKILSAW, INC.

ELECTRIC PNEUMATIC
SKILTOOLS

SKIL Saws · SKIL Sanders · SKIL Sheet · STR Nibbler · SKIL Grinders · SKIL Drills

*This advertisement is appearing in leading industrial publications

WHAT'S NEW?

in Welding Rings

GET THIS FOLDER

Tube-Turn Groove Type Welding Rings with Knock-Off Spacer Pins: A folder of data about a major new development for better pipe welding—a completely engineered welding ring for exact root gap spacing and complete penetration. For complete information get this folder. Mail the coupon.

TUBE-TURN

TUBE-TURN—*T. M. Reg. U. S. Pat. Off.*

WELDING FITTINGS AND FLANGES

District Offices at New York, Philadelphia, Pittsburgh, Detroit, Chicago, Houston, Tulsa, San Francisco, Los Angeles

Tube Turns, Inc., Dept. 3011, Louisville 1, Kentucky

Please send folder, "Tube-Turn Groove Type Welding Rings."

Name.....

Position.....

Firm Name.....

.....

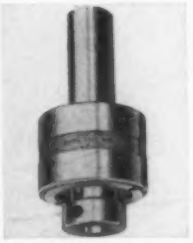
Street.....

City.....*Zone*....*State*.....

(*Continued from page* 158)

secured in a bench vise and a wrench applied to the handle. The alloy steel handle has been twisted off without yielding of the braze, it is claimed. *Atlas Welding Accessories Co., 707 E. Lewiston, Ferndale (Detroit), Mich.*

FLEXIBLE TOOL HOLDER



"TOOL - FLEX" Neoprene mounted, non-releasing, pull-out type flexible tool holder is claimed to increase efficiency of tapping on screw machines. Mounting prevents binding, absorbs shock, keeps taps on center and permits them to follow the drilled hole, it is said. Pull-out action of holder is claimed to compensate for difference in cam motion and tap travel when backing out. All holders are made of alloy steel, heat-treated and ground to close tolerances, and have no parts to wear, according to maker. Catalog available. *Burg Tool Mfg. Co., 5028 W. Jefferson Blvd., Los Angeles 16, Calif.*

NEW WOOD-WORKING TOOL

ALADDIN woodworking tool is designed to fit on any standard drill press and will make an unlimited number of cuts, such as tongue and groove, inlay, fluting, notching or any type of joint, according to maker. It is said to be suitable for small shops and practical for large shops to handle special jobs or jobs requiring quick changeover. Model 60 is equipped with a bearing to anchor the tool to the bottom of the drill press, Model 50 is not. Literature available. *Aladdin Mfg. Co., 818 Grand Ave., Kansas City, Mo.*

ACID-PROOF BRUSH

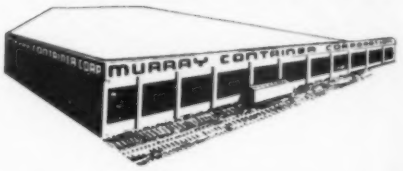
DEVELOPED for use by industrial users of acids for cleaning operations, this acid-proof brush, is made with a soft tuft of "FybR-glass" solidly imbedded in a wood handle of conventional shape. When wet, brush becomes soft and pliable. It may be used, it is claimed, in any acid that does not affect glass. Illustrated brush measures 3" in width, ⅜" in thickness and has bristles extending 2½" from the handle. Other sizes can be made for special purposes. *The Eraser Co., 104 S. State St, Syracuse, 2, N. Y.*

(*Please turn to page* 162)

WE ARE PLEASED TO ANNOUNCE

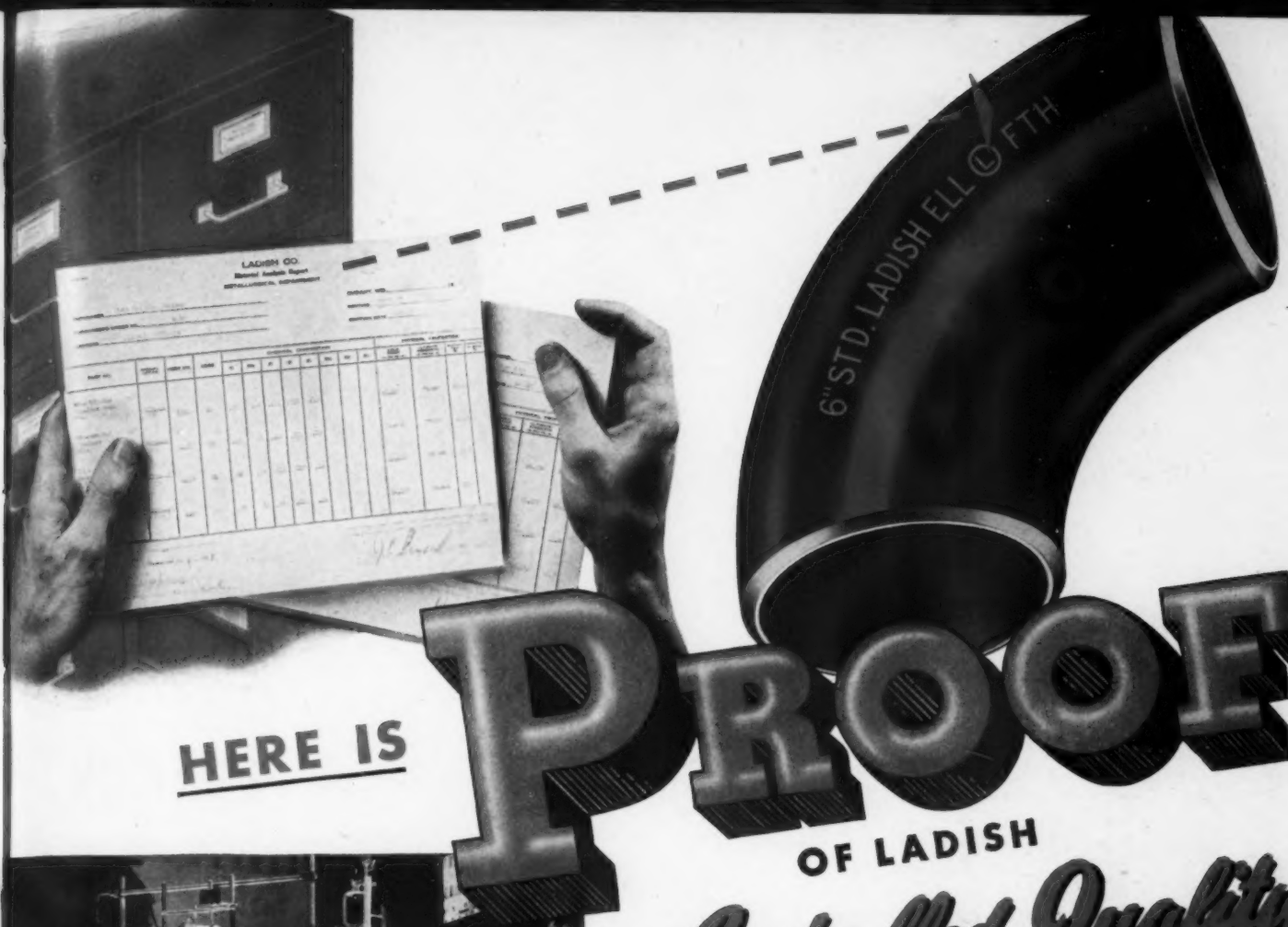
A GREAT NEW MANUFACTURING SOURCE OF CORRUGATED BOXES FOR YOU!

• MURRAY
• CONTAINER
• CORPORATION



Murray Container Corp. takes pleasure in announcing the opening of a new manufacturing plant in Philadelphia. Covering 110,000 square feet of space, and completely equipped with the *newest* and finest in equipment, we offer tremendous production capacity in corrugated and solid fibre boxes and sheets, cleated fibre boxes and die-cut specialties. Your inquiries are invited and will receive prompt and personalized attention.

MURRAY
CONTAINER CORP.
23rd & WASHINGTON AVE., PHILA. 46, PA.



HERE IS PROOF OF LADISH *Controlled Quality*

You have scientific proof of metal soundness in seamless welding fittings when you specify Ladish.

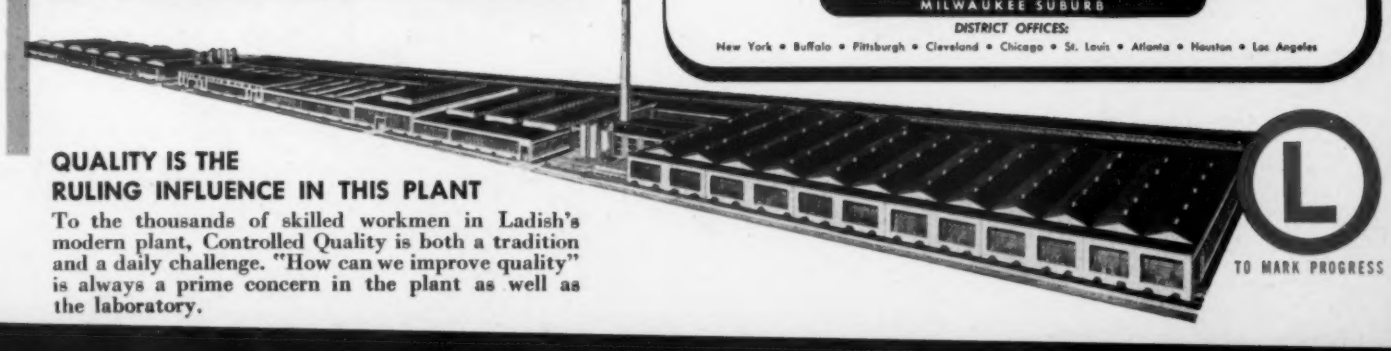
Certified laboratory reports . . . available on request by referring to the Ladish heat code symbol of Controlled Quality marked on every fitting . . . provide complete test data on chemical composition and physical properties of the steel heat from which any Ladish fitting was forged. Here is actual proof of reliability which assures extra years of trouble-free piping service when you install Ladish Seamless Welding Fittings.

A COMPLETE LINE PRODUCED UNDER ONE ROOF
. . . ONE RESPONSIBILITY

LADISH CO.

CUDAHY, WISCONSIN
MILWAUKEE SUBURB

DISTRICT OFFICES:
New York • Buffalo • Pittsburgh • Cleveland • Chicago • St. Louis • Atlanta • Houston • Los Angeles



QUALITY IS THE RULING INFLUENCE IN THIS PLANT

To the thousands of skilled workmen in Ladish's modern plant, Controlled Quality is both a tradition and a daily challenge. "How can we improve quality" is always a prime concern in the plant as well as the laboratory.

L
TO MARK PROGRESS

Newark TESTING SIEVES

EXACT OPENINGS

NO CREVICES

STRONG DURABLE CLOTH

CLOTH RENEWABLE

If raw material control, laboratory testing or product control in your plant calls for accurate sieve testing, Newark's Standard Testing Sieves have a definite place in your plant. Made to conform with the latest specification of the National Bureau of Standards and the American Society for Testing Materials, these sieves are extremely accurate, and, as with testing instruments of all types, accuracy is of first importance. Newark Sieves are accurate because among other things the mesh is exact and there are no crevices to catch particles.

Newark Standard Testing Sieves are available in a complete range of sizes and we shall be glad to recommend the best range of meshes for your particular requirements.

NEWARK for ACCURACY

Newark Wire Cloth COMPANY

346 VERONA AVENUE • NEWARK 4, NEW JERSEY

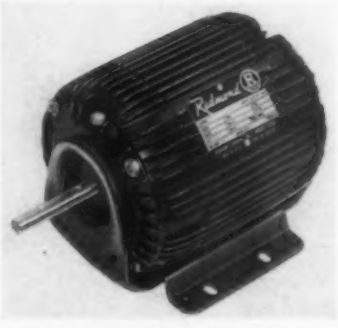
STRETCHER & TRANSFER CHAIR

FIRST AID litter, known as the Collapsi-Cot, can be converted for use as a flat stretcher, transfer chair, convalescent lounge and other emergency uses. It has an adjustable back-rest which can be instantly set to any desired degree of positioning. Additional comfort is afforded by the suspended hammock construction and elimination of spreader bars. Hammock also eliminates necessity of using a mattress. Guaranteed to hold up to a 620 lb. load. Size opened: 75″ long, 20″ wide, 6″ wheel height; collapsed, 48″ long, 20″ wide, 2″ thick. *Emergency Aids Co., 2201 W. Winona St., Chicago 25, Ill.*

ALUMINUM PAINT BASE MATERIAL

ALPASTE is a base material for aluminum paint that is said to put an armor-like, durable, protective shield on wood, concrete, metal, brick and other materials, and to bar corrosion and shut out moisture. Paint made with Alpaste is claimed to have unusual opacity and to cover surfaces thoroughly. The paint can be applied with brush or spray, and is used both for finishing and as a primer. Further information available. *Aluminum Import Corp., 620 Fifth Ave., New York 20, N. Y.*

FRACTIONAL HP MOTORS



SIX-POLE shaded pole fractional horsepower electric motors, designated as Type "Y", are for applications specifying 1000 rpm with full rated loads. The line includes ventilated models up to 1/15 hp and totally enclosed models up to 1/20 hp. Both types are said to handle deep pitch fans with a minimum of air sound. Die cast cases are machined for accurate alignment and are formed with finned surfaces for maximum cooling. *Redmond Company, Inc., Owosso, Mich.*

(*Please turn to page* 164)

"Finest fruit I've growed in 40 years—"
John Toms
FLAVOR RIDGE
SHIPMAN, VIRGINIA
"Finest fruit I've growed in 40 years—" John Toms

(packaged in OLD DOMINION corrugated cartons)

Yes, and such fine fruit deserves to be packaged in boxes that will deliver it in right-off-the-tree condition. That's why the John Toms Orchards at Flavor Ridge, Shipman, Virginia, who do top merchandising and delivering of flavor-fresh apples throughout the season, consulted Old Dominion in designing their package and merchandising scheme. From the penny post card that tells you the fruit is on its way to the colorful card enclosure that speaks with a real Southern accent, every part of the merchandising is as precisely planned as the corrugated box with its sleeve protector.

So, when planning your product merchandising, consult Old Dominion's experts. Old Dominion's eight Southern plants make all types of paper board containers, including set-up boxes, canisters, folding boxes, corrugated containers and acetate packages. Send for General Line Folder No. 90.

OLD DOMINION *Box Company Inc.*

PLANTS LOCATED THROUGHOUT THE SOUTH

CHARLOTTE, N. CAROLINA

THE SOUTHERN BOX MAKER WITH A NATIONAL REPUTATION

Can You Name it?*

Another name might be the
PRODUCTION CASTING OF THE MONTH

SUPERIOR FOUNDRY OF CLEVELAND, OHIO

will show you monthly an outstanding example of production castings...

that our modern and completely staffed and equipped Foundry turns out regularly for satisfied customers. They know that it saves them time, money, and production headaches to always bring their casting problems to

SUPERIOR

SUPERIOR FOUNDRY, INC.
3542 EAST 71st STREET • CLEVELAND 5, OHIO

MICHIGAN 3078

*You're an expert if you identified this as a Retainer Bearing Housing. This casting is made of uniformly close grained, easily machineable gray iron.

GUARANTEED PERMANENT MAGNETIC PULLEY

PERMANENT magnetic pulley with Alnico poles, is available in 53 sizes from 12" diameter x 12" width to 30" diameter x 60" width. It is designed as head pulley in a belt conveyor system or in a self-contained magnetic pulley type separator unit. No electrical wiring is required. Manufacturer guarantees magnetic permanence forever, provided magnet is properly used. Known as the Perma-Pulley, it has a crown face to prevent belt weaving and to aid in even distribution of the burden across the belt. *Dings Magnetic Separator Co., Milwaukee, Wis.*

RUBBER-BASE WALL COATING

RUBBER resins, dissolved in suitable solvents, are used as a base in Paratex interior wall coating. No oils or turpentine are used. The coating is a self-sealing flat finish that is said to brush smoothly over painted or unpainted work, and over wall board, brick, concrete, rough or smooth plaster, oil-resin-emulsion paints, or wallpaper. No priming coat is needed. The coating will not show lap marks or shiners, even when applied by an inexperienced person, it is claimed. *Truscon Laboratories, Caniff St. & GT RR, Detroit, Mich.*

GEAR GAGE PAPER WEIGHT

PAPER weight combined with a set of gear gages, made of polished stainless steel, is composed of 12 leaves which include 24 different gear shapes of the following diametrical pitches: D. P.—3,4,5,6,7,8,9,10,11,12,14,16, 18,20,22,24,26,28,30,32,36,40,48,64. The set is said to be practical for visualizing the sizes and strength of teeth, or checking the finished gear for diametrical pitch. Special gages made to order. Literature available. *George Scherr Co., 200 Lafayette St., New York 12, N. Y.*

WAND-TYPE CONDUCTIVITY CELL

TYPE VO-1 wand-type conductivity cell may be used as a dip cell reaching way down, or permanently mounted in place. It has a body of acid-resistant plastic with handle at one end and flush electrodes of bright platinum at the other. It measures 24" long by 1" OD, and for permanent mounting is provided with a bushing of 1" pipe size or larger. Electrical connections are made by means of the 15' heavy neoprene cable with spade-lug terminals. *Industrial Instruments Inc., 17 Pollock Ave., Jersey City 5, N. J.*

(*Please turn to page* 168)

ONLY PHILLIPS CROSS RECESSED HEAD SCREWS

ARE ENGINEERED FOR PRACTICAL PRODUCTION DRIVING

RECESS EDGE ROUNDED AT TOP

Prevents pushing up burrs because contact with driver begins just below top surface of screw head. Easy for driver to "ride in" to a firm seat, without excess strain on driver point wings.

WIDER OPENING AT RECESS CENTER

Absence of sharp corners provides wider center opening. This recess shape aids self-centering of driver. It also permits driving tool contour that insures maximum strength.

RECESS WALLS HAVE MINIMUM TAPER

Steep walls resist tendency of driver to ride or "cam" out of recess. Consequently, less end thrust is needed at any torque. Driver seats fast — stays seated.

LOOK CLOSELY at the Phillips Recess. No sharp corners to burr easily — require slowed-down, fussy starting — or to "beat up" bits.

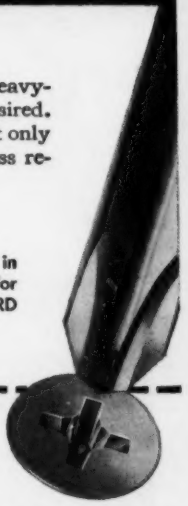
Phillips Engineers shaped this recess according to job conditions, not on abstract theory. They know assembly workers are fast moving, often "heavy-handed," cannot always be as fully trained as desired.

That's why Phillips Recessed Head Screws not only promise, but *deliver* all advantages of the cross recessed head on any assembly job.

GET ALL THE ADVANTAGES OF ASSEMBLY WITH CROSS RECESSED HEAD SCREWS . . . GET

GET THIS NEW BOOKLET to guide you in selecting the right cross recessed head screws for your assembly . . . "Why Phillips is the STANDARD Cross Recessed Head Screw". It's free.

USE THE COUPON



PHILLIPS Recessed Head SCREWS

Wood Screws • Machine Screws • Self-tapping Screws • Stove Bolts

American Screw Co.
Central Screw Co.
Continental Screw Co.
Corbin Screw Div. of American Hdwe. Corp.
Elco Tool & Screw Corp.
The H. M. Harper Co.
Lamson & Sessions Co.
Milford Rivet and Machine Co.
National Lock Co.

25 SOURCES

National Screw & Mfg. Co.
New England Screw Co.
Parker-Kalon Corporation
Pawtucket Screw Co.
Pheoll Manufacturing Co.
Reading Screw Co.
Russell Burdsall & Ward Bolt & Nut Co.
Scovill Manufacturing Co.
Seaboard Screw Corp.
Shakeproof Inc.
The Southington Hardware Mfg. Co.
The Steel Company of Canada, Ltd.
Sterling Bolt Co.
Stronghold Screw Products, Inc.
Wales-Beech Corp.
Wolverine Bolt Company

Phillips Screw Mfrs.,
c/o Horton Noyes Co.
1800 Industrial Trust Bldg.
Providence, R. I.

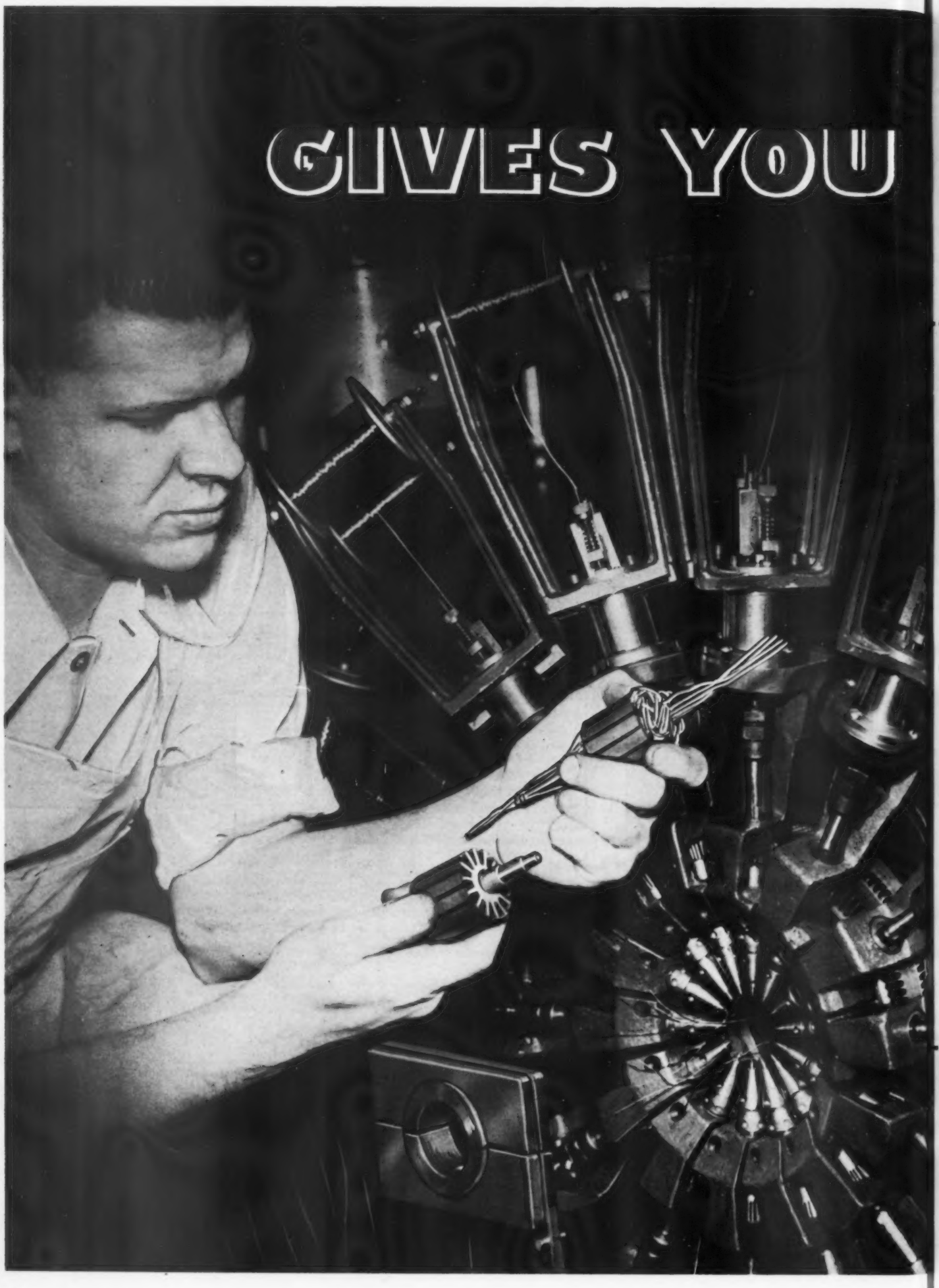
Send me the new booklet — "Why PHILLIPS is the STANDARD Cross Recessed Head Screw".

Name .....

Company .....

Address .....

P-27


GIVES YOU

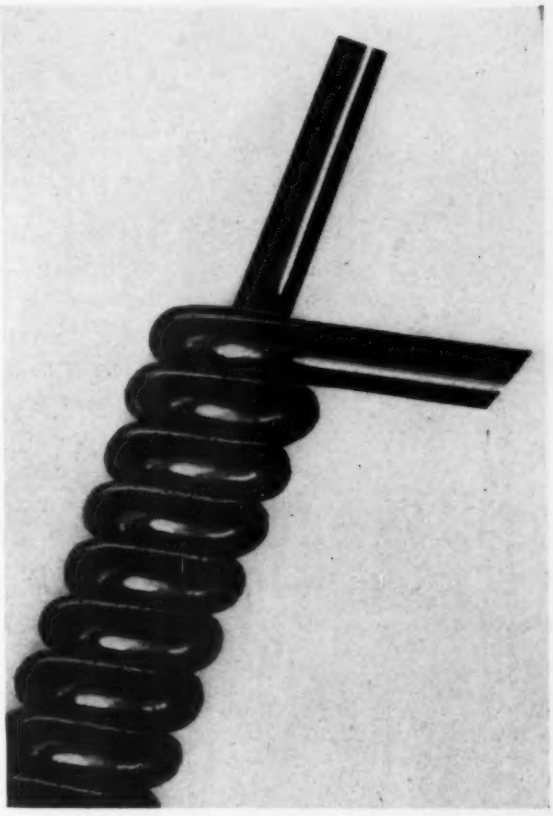
A 3 TO 1 ADVANTAGE

TRY ITS ABRASION RESISTANCE, to learn how tough an insulation is. Roevar Magnet Wire shows a three-to-one advantage over standard enameled wires. And such superiority makes Roevar wire your first choice for high-speed winding operations.

Besides its strength and toughness, Roevar Magnet Wire insulation has high dielectric qualities, is extremely flexible, and has exceptional resistance to solvents used in coil-treating varnishes. Importantly, too, Roevar Wire costs less and is of smaller diameter than magnet wire with paper, cotton or silk insulation. It is furnished in sizes No. 14 to 40 A.W.G.

Roebling engineers are anxious to cooperate with you, in helping determine where Roevar Magnet Wire can be used most effectively and to assure best results. Write for full information and samples of the wire.

JOHN A. ROEBLING'S SONS COMPANY
TRENTON 2, NEW JERSEY
Branches and Warehouses in Principal Cities



Test shows Roevar Magnet Wire (magnified) wrapped on its own diameter, without appreciable loss in dielectric strength.

★ WIRE ROPE AND STRAND ★ FITTINGS ★ SLINGS ★ SUSPENSION BRIDGES AND CABLES ★ AIRCORD, AIRCORD TERMINALS AND AIR CONTROLS ★ AERIAL WIRE ROPE SYSTEMS ★ ELECTRICAL WIRE AND CABLE ★ SKI LIFTS ★ HARD, ANNEALED OR TEMPERED HIGH AND LOW CARBON FINE AND SPECIALTY WIRE, FLAT WIRE, COLD ROLLED STRIP AND COLD ROLLED SPRING STEEL ★ SCREEN, HARDWARE AND INDUSTRIAL WIRE CLOTH ★ LAWN MOWERS

ROEBLING

A CENTURY OF CONFIDENCE

HANDLING HEAT with Abrasives

4000° F

Handling the high temperatures used by modern industry is a tough job—it requires materials with rugged physical and thermal properties. Norton has such materials in Alundum and Crystolon abrasives. Their creation in electric furnaces at temperatures of 3700° and 4000° Fahrenheit gives them valuable refractory properties as well as abrasive qualities. And supplementing these two materials there are several Norton electric furnace products which are produced especially for their unique refractory properties.

You'll find these various refractory materials put to effective use in Norton cements, tubes, bricks, plates, tiles and other shapes for

METAL MELTING FURNACES
HEAT TREATING FURNACES
ENAMELING FURNACES
CERAMIC KILNS
BOILER FIREBOXES
GAS GENERATORS
CHEMICAL PROCESSES

If you use high temperatures there are Norton refractory products that will handle heat for you most efficiently. Norton refractory engineers are ready to help you in their selection.

NORTON COMPANY
WORCESTER 6, MASS.
(BEHR-MANNING, TROY, NEW YORK IS A NORTON DIVISION)

NORTON

PULLEY TYPE SEPARATORS

SELF-contained horizontal and inclined magnetic pulley type separators are designed to provide completely automatic removal of tramp iron from such materials as coal, plastics, ore, grain, foods, chemicals, rock, rubber, slag, cement, etc. Each incorporates an Alnico magnetic Perma-Pulley, idler pulley, endless belt and drive Standard models are available with belts of any desired length in widths ranging from 12 to 16 inches. Perma-Pulley diameters range from 12 to 30 inches standard. Manufacturer guarantees magnetic permanence for the life of the Alnico magnet Perma-Pulley. *Dings Magnetic Separator Co., 4740 W. McGeogh Ave., Milwaukee 14, Wis.*

FLUORESCENT INDUSTRIAL LIGHTING UNIT

HEAVY-duty 2-40 watt fluorescent industrial lighting unit, Model No. 2100, is said to eliminate socket breakage and falling lamps. It uses the unbreakable "Twin Turret" lamp holder that holds lamps with a positive grip regardless of vibration. Powerful spring tension on both ends holds lamps so they cannot fall out, and eliminates flicker caused by poor electrical contact, maker states. It mounts singly or end-to-end, flush or suspended on chains, rods or conduit. Four models available. *Mitchell Mfg. Co., 2525 Claybourn Ave., Chicago 14, Ill.*

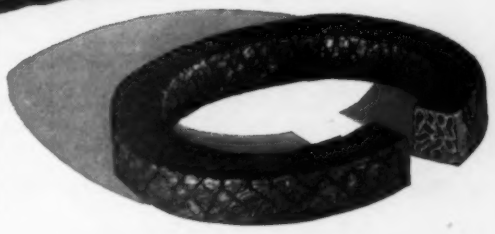
AUTOMATIC TAPE SEALER

LEWIS automatic tape sealer, for widths up to three inches, has a measuring and stop adjuster that is claimed to save up to 50% on gummed tape. The sealer automatically feeds, moistens, measures, cuts-off and delivers desired length of tape in one operation. Floating automatic pressure control weight over brush is said to give correct, uniform, end-to-end moistening for maximum safety in sealing cartons. Covered body keeps mechanism dust-free. Literature available. *Lipton Manufacturing Co., Inc., 52 West Houston St., New York, N. Y.*

(*Please turn to page* 170)

R/M flexible metallic packing

R/M No. 920



R/M's flexible metallic packing is a new and valuable addition to the R/M line, recommended for use on steam and air rods, centrifugal pump shafts, valve stems and other applications where the temperature does not exceed 450°F., and surface speed is less than 600′ per minute.

Like a fabric packing, this packing is sensitive to gland adjustment, but it has the added advantage of non-frictional wearing surface. It is constructed of non-frictional metallic foil and asbestos yarns, combined with temperature-resistant lubricants and flake graphite. The outer layer is an open-mesh, braided cotton jacket.

This packing is typical of the engineering that goes into R/M products. For special jobs where you need packing by prescription, or for the routine work where you demand the utmost in dependability, see the authorized R/M distributor near you.

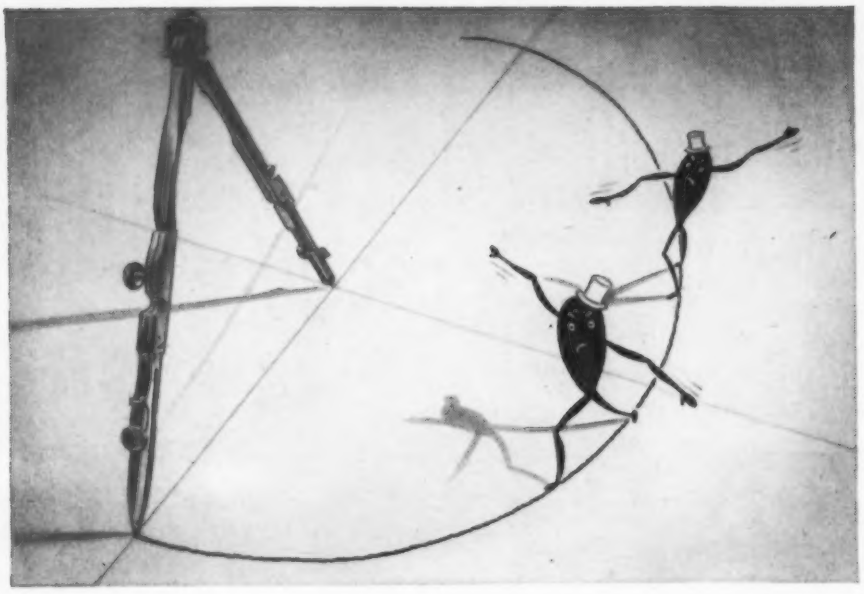
RAYBESTOS-MANHATTAN, INC.

ASBESTOS TEXTILE & PACKING DIVISION

Manheim, Pa. • Bridgeport, Conn. • North Charleston, S. C. • Passaic, N. J.

IT'S "PACKED WITH SATISFACTION" WHEN YOU USE R/M

R/M



The Case of the NERVOUS PERIPHERY

● The tracer had to erase a couple of times. It happens to the best of us. And when he re-inked, his periphery was definitely on the "nervous" side. Next time he'll use Arkwright.

Erasures mean little to Arkwright tracing cloth. It can take erasure after erasure without wearing through, and it re-inks without line-feathering . . . ever!

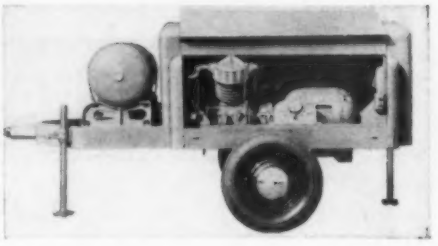
See for yourself how much better Arkwright is. Send for free working samples. Arkwright is sold by leading drawing material dealers everywhere. Arkwright Finishing Co., Providence, R. I.

All Arkwright Tracing Cloths have these 6 important advantages

1 *Erasures re-ink without "feathering"*
2 *Prints are always sharp and clean*
3 *Tracings never discolor or become brittle*
4 *No surface oils, soaps or waxes to dry out*
5 *No pinholes or thick threads*
6 *Mechanical processing creates permanent transparency*

Arkwright
TRACING CLOTHS
AMERICA'S STANDARD FOR OVER 25 YEARS

PORTABLE COMPRESSORS



ELECTRIC portable compressors, known as Air Chief "Electrics", come in 60-105-100-210-315 c.f.m. capacities, and are available in skid, 2-wheel trailer and 4-wheel mountings. The compressors are of two stage construction with intercooler and safety valve. They are direct driven from 1200 r.p.m., 220/440 volt a-c motors of squirrel cage, horizontal type. Motor starters are full voltage, a-c magnetic, non-reversing, standard sheet steel NEMA type 1, 3-phase, 60 cycle with heaters for motor protection. *Davey Compressor Co., Kent, O.*

HAND POWER CENTRIFUGE

HEAVY duty hand power laboratory centrifuge is designed to swing two or four 100 cc tubes with minimum effort. It is said to be suitable for tests in plants which are processing or using petroleum products, foods, paints, pharmaceuticals and for general laboratory use involving precipitation, sedimentations or extractions. It has ball bearings throughout, and a 24 to 1 gear ratio, permitting reduced crank speed. Outer diameter of the swing is 16". *The Gerin Corporation, P. O. Drawer 653, Red Bank, N. J.*

SAFETY GOGGLE

FOUNDRY safety goggle is available in two sizes to simplify fitting different size faces—large and small. Corduroy binding extends around the edge of leather mask for extra comfort and fit. The goggle is said to offer protection against impact hazards in such foundry work as melting, pouring, chipping, etc. The goggle is available with Super Armorplate or 6 Curve Super Armor plate lenses, clear or Calobar in medium, dark or extra dark shades. Wire screen ventilators around eyecups keep lenses from fogging. *American Optical Co., Southbridge, Mass.*

(*Please turn to page* 174)

Typical installation of BullDog Engineered DF-30 Switchboard. BullDog manufactures Vacu-Break Safety Switches • SafToFuse Panels • Superba and Rocker Type Lighting Panels • Switchboards • Circuit Master Breakers • "Lo-X" Feeder BUStribution DUCT • "Plug-In" Type BUStribution DUCT • Universal Trol-E-Duct for flexible lighting • Industrial Trol-E-Duct for portable tools, cranes and hoists.

Phantom view of DF-30 SAFtoSWITCH Unit, showing ball-bearing guide mechanism. Separate fuse and switch compartments for safety . . . in OFF position fuses are disconnected from "line" and "load."

No headaches with this "brain" in your power system

WHEN your Main Switchboard is the BullDog DF-30 type, your power system headaches end.

The BullDog DF-30 SAFtoSWITCHBOARD is compact. Spare space for future requirements can be provided. Interchangeable units can be rearranged to meet the changing requirements of your plant. Provisions can also be made for main circuit-breaker protection, transformers, and metering equipment.

Switch units are the famous DF-30 SAFtoSWITCHES. Approved by Underwriters for all sizes from 30 to 1200 amperes, inclusive, 600 volts and less.

Ball-bearing action of the switch units *reduces friction and maintenance.* Quick, simultaneous double-break reduces arcing. When thrown OFF, both "line" and "load" sides are disconnected; there's no possibility of feedbacks with a BullDog DF-30 SAFtoSWITCHBOARD.

Call in your local BullDog Field Engineer and let him introduce you to the "brain" that has no headaches. He'll be glad to explain how a BullDog DF-30 SAFtoSWITCHBOARD gives you finger-tip control for your whole plant in one compact main switchboard.

BullDog's Field Engineers welcome the chance to sit in on planning stages of a building project. Their knowledge of electrical distribution layout can mean savings in installation and maintenance costs, as well as highest efficiency and reliability in actual operation. Why not take advantage of this pre-building service?

BULLDOG ELECTRIC PRODUCTS COMPANY

DETROIT 32, MICHIGAN • FIELD OFFICES IN ALL PRINCIPAL CITIES

IN CANADA: BULLDOG ELECTRIC PRODUCTS OF CANADA, LTD., TORONTO

BULLDOG

HEADQUARTERS FOR ELECTRICAL DISTRIBUTION

ANNOUNCING A CAPACITY RATINGS

**Makes possible the use of smaller bearings—
with savings in bearing cost, material cost and weight
—and more compact product design**

IN the ten years since the present load capacity ratings of Timken tapered roller bearings were established, Timken bearings have been steadily improved. Improved so much that today the load carrying capacity of Timken bearings is a good *25% greater* than it was 10 years ago!

As a result, The Timken Roller Bearing Company is now able to announce a 25% increase in the load capacity ratings of all Timken bearings —following a careful review of laboratory studies on fatigue life machines over the past ten years, together with close observation of bearing performance in the field.

Permits Use of Smaller Bearings

Now you can safely carry your present bearing loads on smaller size Timken bearings. Reductions in size of shafts and housings are possible. Products can be made more compact—lighter in weight. You have an opportunity to save both on bearing costs and material costs. And this increase in ratings should enable engineers to utilize the advantages of Timken bearings in an even broader variety of applications than has been practicable in the past.

Result of Constant Quality Improvement

This 25% increase in Timken bearing capacity ratings is based on continued improvement in the quality of Timken tapered roller bearings over the past 10 years. It is due to a number of factors, including improved alloy steels made in our own Timken steel mill specifically for anti-friction bearings, better metallurgical control in the processing of this steel, more accurate manufacturing equipment, greatly improved surface finishes, and more accurate inspection methods. That these improvements in Timken bearing quality have resulted in 25% greater load capacity has been conclusively demonstrated by years of exhaustive laboratory and field studies!

New Engineering Journal to Give Facts

A new Timken Engineering Journal is now in

25% INCREASE IN OF TIMKEN® BEARINGS

The result of years of constant improvement in Timken bearing quality—supported by exhaustive laboratory studies and extensive field experience

preparation which will give complete capacity rating tabulations and will also include new bearings introduced since the last publication. Pending publication of the new Journal you may take full advantage of the 25% capacity increase by multiplying the existing ratings by 1.25.

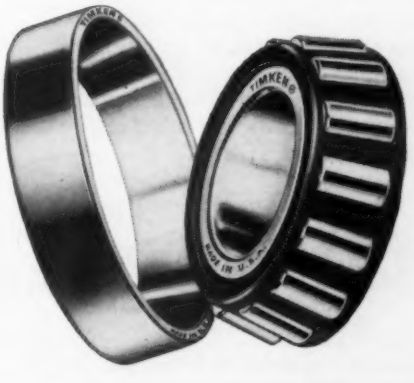
For further assistance in the application of Timken bearings, call upon our field engineers or our Engineering Department.

Timken tapered roller bearings take any combination of radial and thrust loads, hold shafts in rigid alignment, assure precision and minimize friction. The 25% increase in load capacity ratings is the *latest* example of Timken leadership in serving the bearing needs of all industry . . . one more reason why it pays to look for the trade-mark "Timken" on every bearing you use. The Timken Roller Bearing Company, Canton 6, Ohio. Cable address: "TIMROSCO".

TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS



NOT JUST A BALL ○ NOT JUST A ROLLER ⊂⊃ THE TIMKEN TAPERED ROLLER ⊂⊃ BEARING TAKES RADIAL ⊕ AND THRUST →⊕← LOADS OR ANY COMBINATION

The transmission gear of Launderall completely automatic washing machines is made of Ampcoloy bronze to assure trouble-free service. Launderall is a product of F. L. Jacobs Co., Detroit, Michigan.
Gear-anteed
for a lifetime of Mondays

. . . with long-wearing Ampcoloy Continuous-cast Bronze

. . . in addition, Ampcoloy in continuous-cast rods and tubes provides production savings

Critical parts made of long-wearing Ampcoloy are a "quality" selling feature in any product.

There's added *economy* for you, when you use Ampcoloys in continuous-cast form (produced for Ampco by the American Smelting and Refining Company). The close tolerance and sound structure of continuous-cast rods and tubes can cut costs four ways:

1. Allows fast screw-machine production — a saving in manpower, time, and money.
2. Rejects and scrap loss due to metal flaws are practically eliminated.
3. Tools last longer because of a sand-free surface and no internal segregation.
4. Close size-tolerance reduces machining time, storing and handling of raw material, and waste.

Continuous-cast rods and tubes are available in a variety of Ampco alloys, and a range of diameters and lengths. For complete information, write for Bulletin 69.

AMPCO
TRADE MARK
REG. U. S. PAT. OFF.

Ampco Metal, Inc.
Department P-3 Milwaukee 4, Wis.
Field offices in principal cities

Specialists in engineering, production, finishing of copper-base alloy parts.
A-35

MATERIALS HANDLING TRUCK

POWER-driven "Jackstacker" for moving and stacking materials on skid platforms, pallets, or in sectional bins, is suited for use where there are narrow aisles, congested areas, freight car loading or unloading or where floor and elevator capacities prohibit the use of fork truck or heavy equipment. Electro-hydraulic lifting and lowering and the gear drive traction unit are battery powered. It is not necessary to halt the truck in order to raise or lower lifting carriage, as all controls are mounted in the handle head. Available in four models. *Lewis-Shepard Products, Inc., 285 Walnut St., Watertown 72, Mass.*

HAND POWER CUTTING TOOLS

PORTER hand power cutters are claimed to offer ease, strength and safety in cutting of bolts, rods, wire, cable, chain, bars and metal of all kind. Features include: curved toe-in handles which decrease armspread and wrist bend; broad rounded palm-fit which reduces fatigue; no protruding screws or bolts to catch; metal safety handle stop; jaws plainly marked showing capacity and type of metal safely cut. Literature available. *H. K. Porter, Inc., Somerville, Mass.*

VERTICAL GEARMOTOR

SELF-contained vertical gearmotor consists of a high speed motor and speed reducing unit. Nine different gear ratio combinations are available, ranging from 7.61:1 to 38.9:1. The gearmotors are available in 3 to 50 hp, 220, 440 or 550 volt, 3-phase, a-c, and 3 to 7½ hp, 115 or 230 volt, d-c. They may be equipped with practically any standard motor in a variety of enclosure types including: open protected, semi- or totally enclosed and explosion proof. *Westinghouse Electric Corp., P. O. Box 868, Pittsburgh 30, Pa.*

(*Please turn to page* 176)

The whirling quandry of packaging problems is a never ending search of the most for the least. The first consideration in planning your product packaging will be the versatile characteristics your product package needs. It's this extra versatility that's custom built into a set-up box which makes more and more manufacturers choose this type of container.

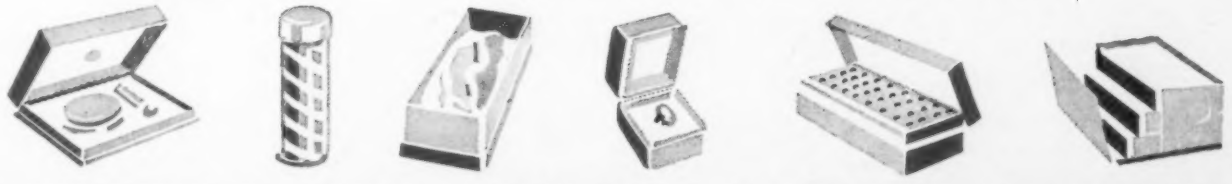
If your product needs greater see-ability, better display value, added product protection and profitable take-home value, you'll find these features at no extra cost in a set-up paper box — and added product sales, too. More versatility can be built into a set-up box at no extra cost than in any other container.

Investigate these "sales appeal" packages today. See your nearest set-up box manufacturer.

NATIONAL PAPER BOX MANUFACTURERS Association

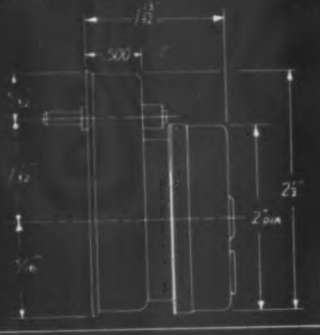
AND COOPERATING SUPPLIERS

Liberty Trust Building • Philadelphia 7, Penn.



FOR INFORMATION OR SERVICE • CONSULT YOUR NEAREST SET-UP BOX MANUFACTURER

TITLE: NEW TIMING DEVELOPMENTS
FOR: ELECTRICAL MANUFACTURERS
MAT'L: SYNCHRONOUS MOTORS
SOURCE: HAYDON MFG. CO., INC.

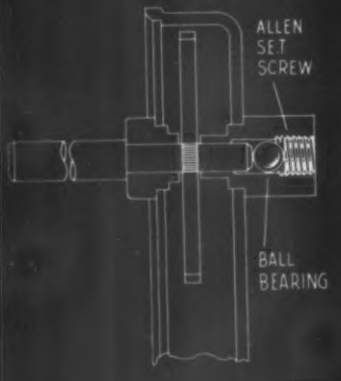


SLOW SPEED MOTOR

New motor engineered to meet demand for a low cost unit with very slow output shaft speeds. Single gear train replaces the double train formerly required for reduction from 450 rpm rotor speed — material and part costs are cut, production simplified. Designed specifically for such applications as stoker and oil burner controls, chart drives, time switches, thermostats, control instruments, etc. Available for 1 revolution per 12 hours, 1 day and 1 week.

OSCILLATING SHAFT

Normal rotary movement of drive shaft is converted to oscillating motion by special linkage between drive wheel and shaft. Standard model #1891, using 30 rpm motor, furnishes complete 30° shaft oscillation every 2 seconds. Control of current pulses in electric fence timers is typical application.



SPECIAL THRUST BEARING

Drive shaft and bearing assembly designed to absorb vertical thrust. Special shaft assembly incorporates ball bearing; set-screw assures proper adjustment of shaft and bearing. Typical applications include displays, turntables, barber poles . . . all installations where load on output shaft is heavier than can be safely carried by standard construction.

These designs are typical of the versatility and wide range of the Haydon line . . . providing timing mechanisms to meet special requirements. If your needs are unusual, consult Haydon timing engineers. Send for new Haydon Engineering Data Catalog.

Write HAYDON, 2203 Elm Street, Torrington, Connecticut

HAYDON

MANUFACTURING COMPANY, INC.
TORRINGTON, CONNECTICUT
HARNESS TIME TO YOUR PRODUCTS
SUBSIDIARY OF GENERAL TIME INSTRUMENTS CORPORATION

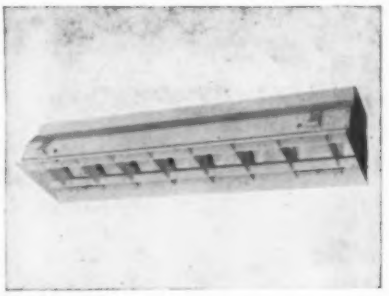
POWER SWEEPER

ALL-PURPOSE power sweeper for keeping floors free of welding rod butts, nails, chips, paper, dirt, waste materials, etc., is said to be effective both indoors and outdoors. It is designed to get in close to walls, curbs, trees, etc. Manufacturer claims that the sweeper will do the work of 4 or 5 men with brooms or rakes. It rides on 10 x 2.75 zero pressure tires. It is drizen by a 1½ h.p., air-cooled, 4-cycle gas motor. *Wilshire Power Sweeper Co., 3636 E. Foothill Blvd., Pasadena 8, Calif.*

AUTOMATIC SIDE CASE SEALER

A-B-C automatic side sealer is designed to seal both ends of long, narrow, top-heavy cases that no "erect position" machine will handle, according to the manufacturer. It is said to be suitable for handling all thicknesses of corrugated containers and heavy solid fiber cases. Adjustment for case size is done electrically. Glue pots are available to assure an even thin flow of glue. The machine will handle up to 3,600 cases per hour, it is claimed. Literature available. *A-B-C Packaging Machine Corp., Moberly, Mo.*

TROFFER LUMINAIRE

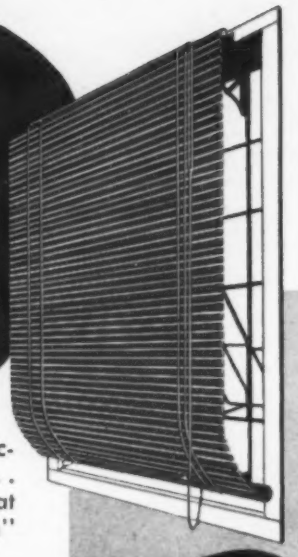


THIS troffer luminaire, available for one 40-watt, one 100-watt or two 40-watt fluorescent lamps, can be shielded by egg-crate louvres, cross baffles, glass door, or left open without additional shielding. The troffers are 12" wide and either 48" long for 40-watt lamps or 60" long for the 100-watt size. They can be installed in any standard suspended ceiling in which a suitable metal or wood frame is provided. All lamp operating equipment can be removed from or installed in the housing while it is in place on the ceiling. *Westinghouse Electric Corp., Box 868, Pittsburgh, Pa.*

(*Please turn to page* 178)

Satincast
THE "NEW LOOK" IN
COOPER
STAINLESS STEEL
FITTINGS
Satincast, smooth as satin itself . . . is a newly developed finish by COOPER ALLOY which is Standard on all COOPER Stainless Steel Fittings. Satincast finish is also available on Special Castings of moderate size.
✱ T.M. REG. PENDING
LUSTRACAST
by COOPER
This famous COOPER ALLOY electrolytic polish for fittings and castings brings out the natural brilliant luster of Stainless Steel as well as greatly increasing its resistance to contamination and corrosion. Lustracast finish is available at a slight extra cost.
Specialists in Corrosion Resisting Stainless Steel
THE COOPER ALLOY FOUNDRY CO.
HILLSIDE, NEW JERSEY

RA-TOX
WOOD SPLINT Ventilating SHADES



RA-TOX wood-splint Shades provide protection from direct sun-rays and reflections . . . they produce a soft, restful illumination that protects your employees from "Eye Strain" and "Glare Fatigue."

RA-TOX Shades are good looking, easy to roll up or down quickly, adjust to changing daylight conditions. Made to your measurements, of basswood splints interwoven with special strong seine-twine . . . heavy duty cord-lock holds shade at any height. Sturdy installation brackets. Up to 15 or 20 year service with ordinary care . . . **Write for latest Folder.**

HOUGH SHADE CORPORATION
(Industrial Division)
1020 JACKSON ST., JANESVILLE, WIS.

LIGHT WITHOUT GLARE!
AIR WITHOUT DRAFT!

Made in sizes and types to fit every style of industrial window either steel or wood sash.

A nation-wide shading service. There is a RA-TOX representative in your area.

RUST-OLEUM
Stops Rust!

THIS FREE CATALOG TELLS YOU HOW . . .

★
It Cuts Maintenance Costs
3 Ways

- **Less Preparation.** No sandblasting or chemical rust dissolvers are necessary. Simply wirebrush to remove scale, dirt, etc.—then APPLY RIGHT OVER THE REMAINING RUST.
- **Goes on Faster.** Rust-Oleum can be applied 25% faster . . . covers 40% more area per gallon.
- **Lasts Longer.** Depending on conditions, Rust-Oleum outlasts ordinary materials two to ten times.

$6,000,000,000 is the nation's *yearly* bill for rust damage to metal due to dampness, fumes, general weathering elements—an *irrecoverable loss.* You pay your share of this waste if your building, equipment and other property are rusting. Do something about it NOW! *Use Rust-Oleum to rustproof metal surfaces.*

You get lasting protection for less than 1-cent per square foot material cost, Rust-Oleum can be applied over metal already rusted — *wirebrushing away loose scale is only preparation required.* It penetrates rust . . . incorporates it in the film and forms a tough, durable, elastic coating that defies rust-producing conditions. *Available in all colors and aluminum.*

GET THE FACTS—Mail This Coupon TODAY!

RUST-OLEUM CORPORATION
2439 Oakton Street • Evanston, Illinois

Please send a free copy of the new Rust-Oleum Catalog of color selections and recommended uses.

*Name*_____

*Company*_____

*Address*_____

*Town*_____ *State*_____

☐ **Check here for name of nearest distributor.**

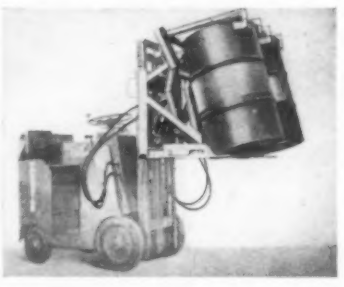
RADIAL RELIEF FIXTURE

ILLUSTRATION shows fixture developed to produce radial-relieved cutting tools. On screw machines or vertical type equipment, they are capable of speeding set-up time, reducing machine running time and reducing maintenance cost, according to manufacturer. It is claimed that with this fixture, tool-grinder operators of average ability can handle most radial-relief jobs within one week. Wide adaptability is claimed because the fixture is easily installed on any universal tool grinding machine by removing the grinder head stock. Literature available. *Glenbard Tool Mfrs., 216 N. Clinton St., Chicago, Ill.*

ABRASIVE CUTOFF MACHINES

ILLUSTRATION shows Model W abrasive cutoff machine that has a coolant tank and pump, for wet cutting. It uses a 16" wheel, powered by a 7½ hp motor. The use of coolant is said to reduce cutting speed slightly but to assure better wheel life and surface finish free from burr and discoloration from burning. Model D-2 is a dry-type machine using a 10" wheel mounted on a swinging arbor, powered by a 3 hp motor. Both machines are said to provide extremely high speeds for fastest possible cutting. Catalogs 47-513 and 47-514 available. *The DoAll Co., Des Plaines, Ill.*

BARREL HANDLER



DRUM Master, an attachment for handling drums, barrels or casks, can be installed on any hydraulically operated fork truck. Maximum flexibility is said to be obtained by incorporating special chine clamps as standard equipment in addition to the regular tilting arms. The device can pick up containers singly or in pairs. The attachment can be removed readily, and the forks replaced. *William Ehlers, 408 S. Spring St., Los Angeles, Calif.*

(*Please turn to page* 180)

It grows on you!

Here's a switchboard designed so that it can *grow with you.*

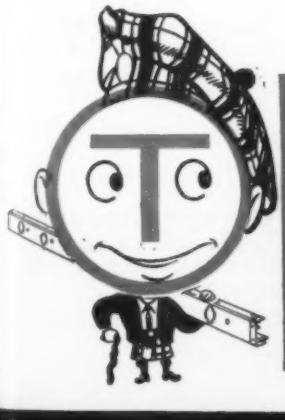
That's right. Trumbull switchboards may be expanded easily and economically to meet your electrical requirements. Standard panels of modular switching units permit flexibility in arrangement, ease of installation and expansion.

Trumbull Front-operated Interlocking (F.O.I.) Switchboard units are the culmination of 48 years experience in designing and manufacturing all kinds of electrical control equipment. They are of Class A fusible construction . . . built for low-cost operation and long life.

Equally flexible in arrangement are Trumbull Automatic Thermal Circuit Breakers (Type AT) for use in unit switchboard construction. Compact and safe, they assure continuous duty (service promptly restored after clearing harmful overloads).

Trumbull engineering "know-how" has combined the principles of unit construction and flexible arrangement to provide a coordinated switchboard assembly that can be tailored to fit your present and future electrical distribution needs.

For latest bulletins write to: THE TRUMBULL ELECTRIC MANUFACTURING CO., Plainville, Conn. Other factories and offices throughout the United States. Foreign representation.



FOR SAFETY'S SAKE—SAY "TRUMBULL"

TRUMBULL (T) ELECTRIC

Switchboards

Yes, it's literally true! Business yearly pays millions in lost man hours and compensation as a result of inadequate on-the-job health protection.

And the toll is climbing. Over 65% of all compensable occupational disease cases are caused by skin troubles — and Public Health Authorities state: *"Cleanliness is the most important single measure for the prevention of occupational dermatoses."*

As the first step they recommend:

1. Sufficient wash basins large enough to permit washing the arms under running water.
2. Faucets or spray in which hot and cold water is mixed.
3. Safe, mild soap, easily accessible.
4. Plenty of efficient, individual paper towels.

Because of their high absorbency and wet strength, just one Onliwon Towel does a thorough drying job — on the arms and in those hard-to-get-at spots between the fingers where the bacteria and fungi of skin diseases so often get their start.

That's why Onliwon Towels can make a real contribution to your industrial hygiene program. Ideal for industrial wash rooms — the most economical and efficient towel service available. Let them help you prevent occupational dermatoses in your plant.

A.P.W.

ONLIWON

WASHROOM SERVICE

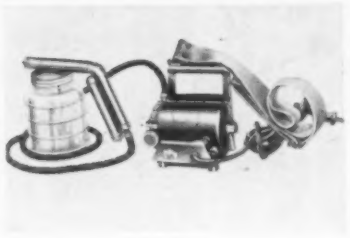
TOWELS • TISSUE • SEAT COVERS

Industrial Division, Room 23
A.P.W. Products Company, Inc.
Albany 1, New York

Please send information concerning Onliwon Washroom Service and name of nearest Onliwon distributor.

Name.....
Position.....
Company.....
Street.....
City.....*State*.....

PORTABLE PAINT SPRAYER



SPEEDWAY portable electric paint sprayer has an adjustable spray head that is said to work well with paint, enamel, varnish, lacquer or stain. The glass jar has a 24-oz capacity and wide mouth for easy filling and cleaning. The grip is the pistol type and has a shut-off valve, thumb-operated to permit instant control. The 110-120 volt universal type motor weighs 4 lbs. and is carried by a shoulder strap. The motor operates on a-c or d-c and develops 22 lbs. of free air. *H. D. Hudson Mfg. Co., 589 E. Illinois St., Chicago 11, Ill.*

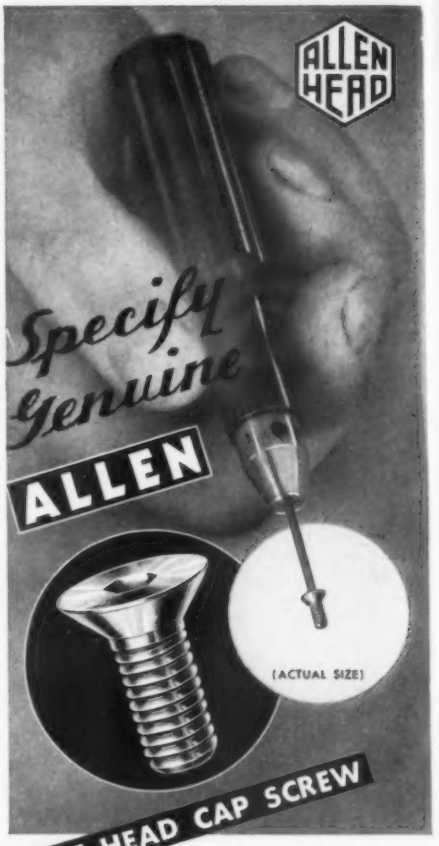
HYDRAULIC LABORATORY PRESS

H-P-M Smooth-Line hydraulic laboratory press of 20 tons capacity has a double-acting ram providing positive pullback pressure for separating molds, dies, etc. Pressing surfaces are 8" x 9". Maximum opening between pressing surfaces is 14". Maximum travel is 8". Maximum pullback pressure is 2½ tons. Manual operating valve controls direction of travel. Press is designed for accurate pressure holding service over long periods of time. Attachments for other operations available. *The Hydraulic Press Mfg. Co., Mount Gilead, O.*

TROUGH CONVEYOR

PORTABLE trough conveyor is designed for handling of all loose materials such as sand, gravel, stone, etc. from hopper bottom cars to trucks or store piles or from piles to bins, etc. It is built in standard belt widths of 16", 20", and 24", and standard lengths from 20' to 60' in multiples of 5'. The conveyor is fitted with electric motor or gasoline engine, and is mounted on steel or rubber tired wheels. *George Haiss Mfg. Co., Div. of Pettibone Mulliken Corp., 381 Canal Place, New York 51, N. Y.*

(*Please turn to page* 182)



Holds to Driver for fast assembling; Stays fast in *flush* set-ups

These advantages reach all the way down to the smallest "V"-Head Cap Screws made. Illustration shows a No. 4 (stock size "Allen") held on a "Handi-Hex" Allen Driver, — fastest fastening combination for small parts in electronic devices. Positive hex-socket wrenching achieves tight set-ups; threading to high Class 3 fit *keeps* them tight... Write us for informative data and samples; your local ALLEN Industrial Distributor supplies the screws.

BUY FROM Your local Industrial Distributor

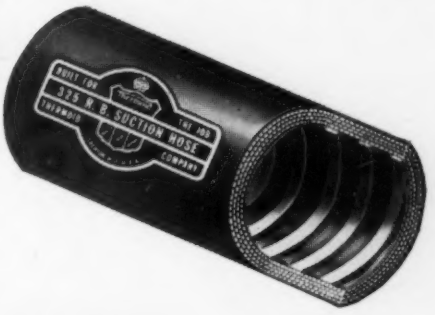
THE ALLEN MFG. COMPANY
HARTFORD 2, . . . CONNECTICUT, U. S. A.

Thermoid Water Suction Hose

Made in a Type to Suit Every Job

Water Suction Hose is generally subjected to rough usage. Thermoid has studied carefully the service conditions under which it is used and has designed several types from which you can pick the one best suited to the job you have to do.

For the Toughest Kind of Duty Use Thermoid #325 Type

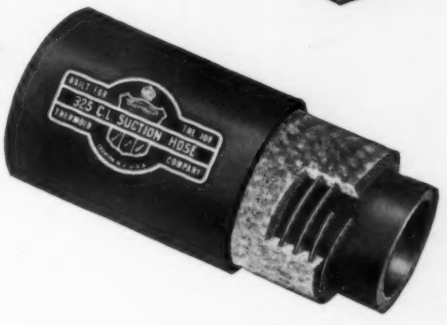


This hose is made in smooth or rough bore. Use smooth bore when sand, dirt or other abrasives are in the water to be handled. Use the more economical rough bore type when the water is free of abrasives. Each type has a high quality tube, strong wire reinforcing, then plies of specially woven duck with a weather and abrasion resisting cover. Supplied in sizes 1¼" to 6" in lengths up to 50 ft.

For Less Severe Service Use Thermoid #350 Type

Somewhat lighter in construction, but with plenty of long life quality for less severe jobs. This hose comes in smooth or rough bore, wire and duck reinforced, with weather and wear resisting cover. Supplied in sizes 1½" to 6" and in lengths up to 50 ft.

For Normal Light Duty Use Thermoid Type #325-CL



It's an economical hose for normal light duty service. The water way is smooth, resistant to action of gritty particles, the reinforcement of high carbon steel wire interwoven with heavy cotton yarn, cover of sufficient thickness and strength to resist abrasion and rough handling. Furnished in sizes of 1½" to 6", in lengths up to 50 ft.

Other types of Thermoid Suction Hose include Oil Suction, Sand Suction, Agricultural, Hard Rubber and Fire Engine. Catalog information on request.

It's Good Business To Do Business With Thermoid

Thermoid concentrates its manufacturing for industry on a well integrated line of industrial rubber and friction materials. The company itself is large enough for precise, low cost, high quality production, but small enough to allow personalized attention to customers' specific problems.

The Thermoid line includes: Transmission Belting • F.H.P. and Multiple V-Belts • Conveyor Belting • Elevator Belting • Wrapped and Molded Hose • Custom Molded Products • Industrial Brake Linings and Friction Materials.

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SAVE SURFACES by cleaning the modern way . . . with the new General Electric Industrial-Commercial Vacuum Cleaner!

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Built to last! General Electric's Commercial Vacuum Cleaner is built and tested for long, dependable service.

Easily operated by one man with no previous experience. Has attachments for every purpose. Quickly cleans drapes, upholstery and furniture. Models available for wet and dry pickup.

Each machine is backed by the General Electric Company warranty. For further details, mail coupon below. General Electric Company, Bridgeport 2, Connecticut.

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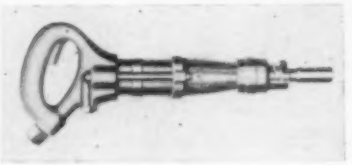
PORTABLE PIPE THREADING MACHINE

RED-E-HAUL portable power pipe threading machine is designed for installation and maintenance of all piping from ½" to 2" in size. The range can be extended to all sizes from ⅛" to 12" by use of auxiliary equipment. With the machine it is possible to cut, chamfer, ream and thread any pipe ½" to 2" without changing dies. Automatic stop opens the dies after standard length pipe threads are cut, however, any length can be cut. Literature available. *American Tool & Die Co., 652 Third St., Reading, Pa.*

LIGHT HAND DRILL



THIS light weight Cleco drill hits and rotates at the same time, and is said to be adaptable to working in close quarters and in all types of masonry. It weighs 9 lbs. and can be operated with one hand. The tool has a patented safety retainer which prevents accidental release of the drill from the tool, it is stated. The drill is said to have practically no recoil. It operates at a speed of 1800-2000 S.P.M., has a ¼" to ¾" drill capacity and is 13" long, without retainer. *Reed Roller Bit Co., Box 2119, Houston, Tex.*

COMPARATOR WITH WIDE MEASURING RANGE

PROVISIONS for five interchangeable tables and the use of standard indicators are features of the Model 108 comparator, suiting it to wide range of production and inspection measuring jobs. When equipped with Micronar indicator it affords a means of checking plug gages. Any AGD dial indicator of the #2 or #3 size having standard lug type back can be used. Tables available are: 1½" x 4" serrated, 6" x 4" serrated, 1½" x 4" plain, and one with 1½" diameter rolls for checking lobal conditions. *Standard Gage Co., Poughkeepsie, N. Y.*

FOUNTAIN MARKER

ALL-aluminum "Junior Marker" can be carried in a shirt or vest pocket, and has positive ink control. Pressing on the tip opens the valve and allows the ink to flow. Releasing pressure positively shuts off the flow. The marker makes either a fine line or a broad line. It can write on wood, paper, crates, boxes, metal, stone, rock, glass, or on any rough or irregular surface. *Diagraph-Bradley Industries, Inc., 3745-55 Forest Park, St. Louis 8, Mo.*

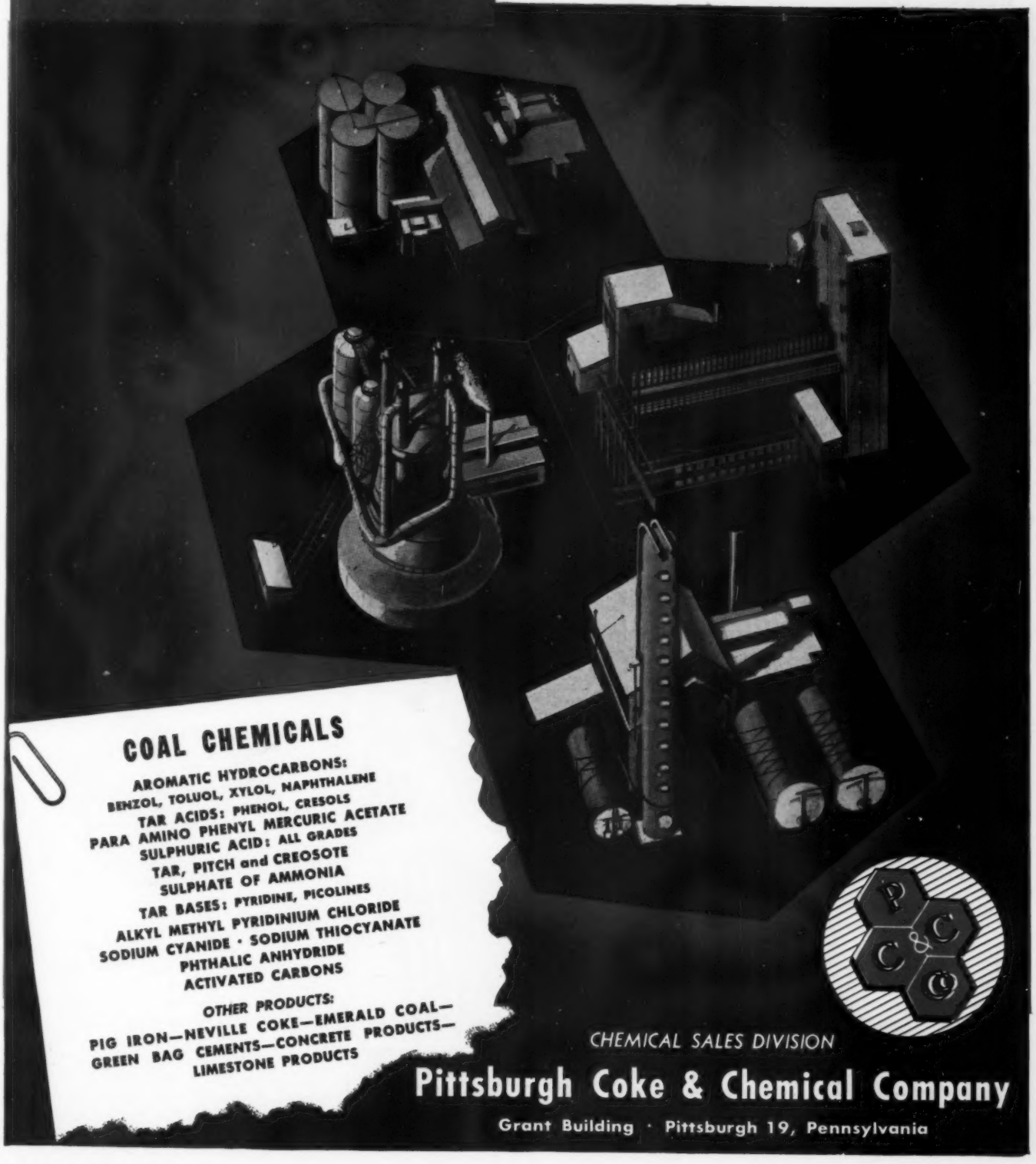
(*Please turn to page* 184)

"PITTSBURGH"

... a dependable source — for

COAL CHEMICALS

Complete integration of its manufacturing facilities plus economical water borne supply of its own principal raw materials, make *Pittsburgh* Coke & Chemical Company a reliable source of supply for Coal Chemicals and associated products. Inquiries for any of the products listed below are invited and, for special applications, technical assistance and recommendations are available for the asking.



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SULPHATE OF AMMONIA
TAR BASES: PYRIDINE, PICOLINES
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Every Sawyer apron is made from the best raw materials obtainable. Expert workmanship and design assures you that a Sawyer apron really protects the worker and gives maximum wear.
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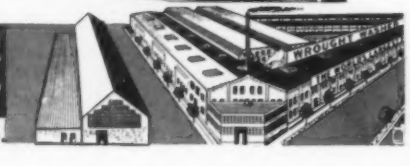
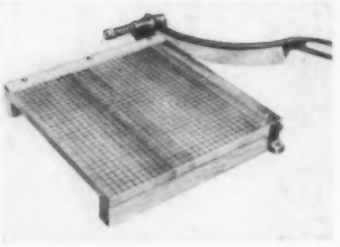


PORTABLE CUTTER

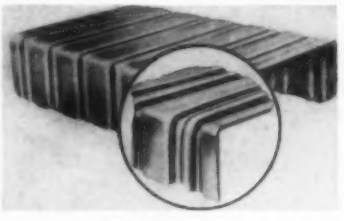


INGENTO No. 8 30" x 30" portable cutter has a metal base and a tempered tool steel blade designed to cut heavy cardboard, corrugated board, cloth, leather, rubber, sheet metal or other tough materials. The cutter can be easily carried about a shop or office, it is said. Features include safety guard rail, running the length of the inside cutting edge, and safety spring-equipped handle that stays aloft at any height while material is being positioned. *The Ideal School Supply Co., 8318 Birkhoff Ave., Chicago 20, Ill.*

PORTABLE VENTILATOR

ALUMINUM portable safety ventilator, called the Saf-T-Air, is electric motor driven, has a capacity of 425 cubic feet per minute, and weighs only 5[illegible] lbs. Balanced handle has been placed over the center of gravity so that the unit can not tip over when carried or hung. It can be used as blower or exhauster, and is said to be suitable for eliminating hazardous fumes, gases, dust, etc. from drums vats, tank cars, boilers, etc. It is also said to be efficient on welding, spray painting and tank-coating jobs. Bulletin B-148 available. *United Electric Motor Co., 178 Centre St., New York, 13, N. Y.*

ALUMINUM SKID PLATFORMS



DOUBLE corrugated one-piece skid platforms, made of aluminum, are claimed to have the advantages of aluminum combined with the strength of mild steel. Two recessed corrugations joined by a raised center rib (as shown in inset above) are said to give the skid platform approximately 1/3 more corrugations than conventional types. Other features are—light in weight; resistant to corrosion; non-toxic; resistant to most acids; will not stain goods; non-sparking; high salvage value. *Union Metal Manufacturing Co., Canton, O.*

These Bolts are too brittle

These Bolts are too soft

These Bolts are just right

Circle Ⓑ Bolts and Nuts . . . both standard and special . . . are carefully inspected for size and strength. Their dependability is a definite asset to products on which they are used.

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THE NEW WESTINGHOUSE "65"

- **New, LOW VOLTAGE with HIGHEST performance and arc stability**
- **New, compact HIPERSIL core**
- **Uniform, continuous current adjustment**

Here's good news for welding users . . . and another pioneering accomplishment by Westinghouse in making a-c welding even more economical, efficient and easy to use!

The new Westinghouse "65" Flexarc A-C Welder overcomes the problems of arc instability which formerly limited the use of lower a-c voltages for heavy-duty industrial welding. It now makes available, for the first time, a line of industrial, heavy-duty a-c welders built to operate with an open-circuit secondary voltage of only 65 volts—the lowest as yet achieved for use with all types of a-c electrodes.

The "65" thus provides the most advanced design of industrial a-c welders. Arc stability is assured over the entire operating range of welding current without the addition of troublesome gadgets. This arc stabilization feature not only aids in striking the arc, but is effective in stabilizing the arc during the entire welding cycle.

Kva consumption is reduced by the lower voltage . . . operating costs are cut. Size and weight are reduced by use of Hipersil cores—an exclusive Westinghouse development—with ⅓ greater flux-carrying capacity.

Flexarc "65" Welders are available in 500, 400, 300 and 200-ampere ratings. Mail the handy coupon below for full details. Westinghouse Electric Corporation, Dept. P, Buffalo 5, N. Y.

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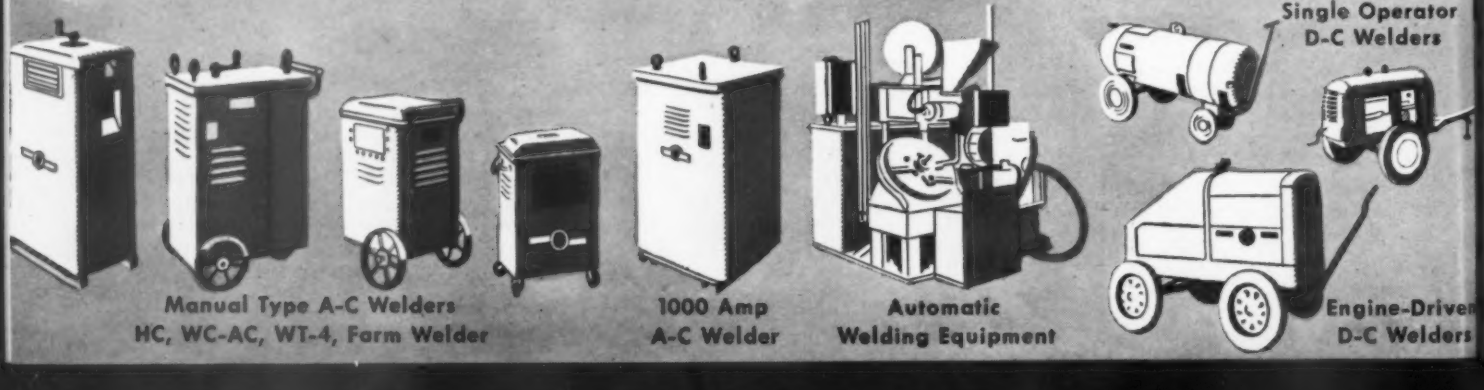

Manual Type A-C Welders
HC, WC-AC, WT-4, Farm Welder

1000 Amp
A-C Welder

Automatic
Welding Equipment

Single Operator
D-C Welders

Engine-Driven
D-C Welders

A-C WELDER . . .

FLEXARC

The Low Voltage welder with the Stabilized arc

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FASTER: Ease in using heavier electrodes with higher currents, and the ability to make excellent welds in all positions assure higher speeds on all classes of work.

CHEAPER: "No-load" losses approximately 15% of d-c, pays for itself in power savings. 85% to 90% electrical efficiency as compared to 55% to 64% for d-c machines.

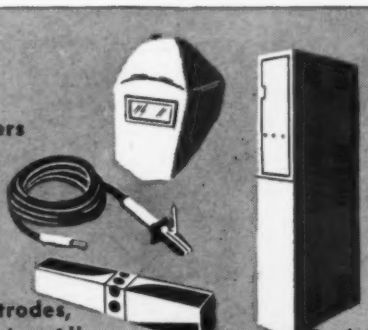
BETTER: Westinghouse A-C Welders eliminate magnetic arc blow—reduce spatter loss—permit welding of heavier sections—assure easy arc control and sounder welds.

Investigate Flexarc A-C Welders today—your Westinghouse representative can give you unbiased counsel on *any* metal-joining process.

...or Welding ANYTHING!

High-Frequency Stabilizers

Portable and Bench-Type Brazers



Electrodes, Brazing Alloys Arc Torch and Accessories

Resistance Welding Control

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YES—send me details on the new Westinghouse "65" A-C Welder—also on items checked.

- ☐ Automatic Welding Equipment
- ☐ D-C Welders
- ☐ Engine-Driven Welders
- ☐ HF Stabilizers
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Development of Synthetic Fuels Industry Urged

Three Types of Synthetic Plants Recommended, One Using Oil and Shale and Others Using Coal and Various Extracting Processes

Declaring that the demand for petroleum and its products is at unprecedented heights and still rising, Secretary of the Interior J. A. Krug recommends the development of at least three synthetic fuels plants, one using oil shale, and the others using coal and different extraction processes. With the present United States and world shortage of petroleum products, especially fuel oils, likely to extend for several years, the Secretary stated that expansion of the synthetic fuels program is imperative.

Reviewing 1947 research and development progress of the Bureau of Mines in the field of synthetic fuels, a program undertaken at the direction of Congress to insure the Nation's economic and military security, Mr. Krug reported substantial strides toward the No. 1 objective—a pattern of scientific, engineering and economic "know how" for American Industry. Highlights of the report follow:

Oil Shale Demonstration Work

At Rifle, Colo., the Bureau's oil-shale demonstration plant produced its first crude shale oil last May when the retorts were placed in operation. Since then, operating under a predetermined schedule of experimental runs, the plant has been producing at a rate of about 50 barrels a day. Concurrently, three additional types of retorting units are being built and will be tested.

The present estimated cost of producing crude shale oil on a large scale is roughly, $2 to $2.50 per barrel. This oil would not compare favorably in quality with oil produced from natural petroleum now selling at those prices but if the present trend towards price increases continues, it will be easily competitive.

Pending completion of a refinery, the shale oil is being used in laboratory engine tests and refining studies. That unneeded for these purposes has been burned successfully as fuel oil in combustion tests conducted in the plant's boiler unit. By relatively simple refining, crude shale oil yields No. 5 or 6 residual fuel oil suitable for use in ships or utility plants. Further refining improvements will be required to produce the lighter distillate Diesel fuel, and gasoline on a commercial basis. It has been demonstrated that shale can be mined mechanically for as little as 70¢ a ton, and mining engineers hope to reduce this figure to 50¢.

Coal to Oil

At Louisiana, Mo., a demonstration plant to produce about 200 barrels of gasoline a day by the hydrogenation of coal is under construction. The demonstration plant will use from 100 to 200 tons of coal or lignite daily. Western coals will be used in intial operations. Under present conditions and with Bureau-developed process improvements, it is estimated that a high grade motor gasoline or aviation gasoline can be produced commercially from coal for about 14¢ a gallon—some 5 to 7 cents more per gallon than the current cost of gasoline from petroleum. No credit has been taken for by-products which may reduce the cost of the product in some plants by 3 to 5 cents a gallon.

Oil Shale Research

At Laramie, Wyo., a new oil shale research and development laboratory building has been completed, providing the space and facilities needed for determining the fundamental chemical, physical and engineering facts of oil shale processing. Results are encouraging but several problems arising from the high sulfur and nitrogen content of the cracked gasoline remain to be solved before the processes can be put into pilot plant operation.

Coal To Oil Research

At Morgantown, W. Va., site of the synthesis gas laboratory and pilot plant unit, encouraging progress was made on processes for cheap production of the carbon monoxide and hydrogen required in synthetic fuels manufacture. Processes under study for making synthesis gas are: 1) gasification of coal in place underground; 2) gasification of pulverized coal entrained in superheated steam containing oxygen; 3) gasification of powdered coal with oxygen and steam in a vertex reacter.

A laboratory-scale apparatus for producing synthesis gas from pulverized coal is in operation at Morgantown, and a larger pilot plant is being built.

At Pittsburgh, Pa., an experimental vertex reacter for gasification of powdered coal with oxygen and steam has been built and is under test.

At Bruceton, Pa., structures to house the main coal to oil laboratories and pilot plants were substantially completed in 1947. Research continues on the hydrogenation and gas synthesis method of converting coal to oil. (Hydrogenation, it is explained, is the only large-scale synthetic process now well adapted to the production of aviation gasoline from coal, yielding a base stock for 100-octane gasoline with good rich-mixture performance. It does not produce a Diesel fuel of as high a quality as the gas synthesis process, but may offer a good method of obtaining fuel oil.

In the coal hydrogenation field, high yields of distillate were obtained in experiperiments conducted on steam stripping of heavy-oil slurry. In the gas synthesis field, production rates several times those in German plants were achieved.

Agricultural Residues

At Peoria, Ill., the Department of Agriculture has placed in operation a small semi-works plant to determine the manufacturing steps and costs for producing alcohol and other liquid fuels from agricultural residues. The process, developed by the Bureau of Agricultural and Industrial Chemistry, consists of converting the pentosan fraction of the agricultural residues to pentose sugars and subsequently the cellulose fraction to dextrose which are then converted to the liquid fuels butanol, isopropanol, acetone, ethanol or furfural.

NEW STEEL CAPACITY INTENSIFIES RAW MATERIALS PROBLEMS

Some of the problems of obtaining increased quantities of raw materials, required for the operation of the steel industry's enlarged capacity, are still to be solved, said Walter S. Tower, President, American Iron and Steel Institute, at meeting of the New York section, American Institute of Mining and Metallurgical Engineers.

"Without increased quantities of raw materials, the recent and prospective expansions of capacity will be valueless as regards increased output of steel," said Mr. Tower. "Suppose, for example, that the industry, a year hence were called upon to produce to the limit of the 96,000,000 tons of capacity which are expected to be available before the end of 1949. To do that job the industry would need about 115 million tons of iron ore, more than 100 million tons of coal, a minimum of 20 million tons of market scrap, and huge quantities of fuel oil, natural gas and electrical energy. The industry has not had such supplies of materials in any year. Some of the problems of making them available are still to be solved.

"One of the major problems which has cropped up along the steel industry's assembly line of materials is unsatisfactory quality of coal. The main defects, as reflected in blast furnace coke, are higher ash content, more sulphur and poorer mechanical properties. The chief effect of inferior quality in coking coal is lessened output from blast furnaces, and resulting loss of tonnage of hot metal for steelmaking.

"Some recent figures given us by several representative companies reveal that the average loss of pig iron production by the several reporting companies was 8 per cent or 80 tons per day for a 1000-ton furnace. When spread over the whole industry, that scale of lessened supply of iron directly due to poorer coal, means a substantial handicap on steel production.

"To help solve the problems created by those conditions steel companies are spending large sums for coal washing plants. They will have the benefit of some of these new facilities before the end of 1948. But the basic problem of preparation of raw materials will continue to get more attention. (*Continued on page* 190)

If Your Product Uses SHEET ALUMINUM MAGNESIUM, STAINLESS STEEL

CHECK COLGATE FACILITIES for fabricating it

Important advantages in fast deliveries, savings in freight and lowered manufacturing costs accrue when utilizing the integrated facilities of a specialist in fabricating the light metals. Geared to the needs of industries demanding the utmost in value, Colgate services can save time, trouble and expense in getting a new product into production or in expanding output of present products.

For manufacturers in the East, Colgate location—an hour from New York City—affords fast delivery, easy communication and reduced shipping costs. For those in the West, this location is ideal for a factory serving as an Eastern Branch Plant or as a supplier to exporters shipping from Middle Atlantic or New England ports.

Individual parts, major subassemblies or finished products are efficiently produced by these integrated Colgate facilities:

ENGINEERING ... skilled technicians to work with your engineers.

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Twenty pages packed with facts on Colgate facilities and services can be of substantial help in selecting a fabricator. This illustrated brochure is yours for the asking.

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GRAY IRON
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2 FOUNDRIES
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equipped for fast, efficient production to meet your casting requirements.

Special facilities for rollover and cope-and-drag production to 150 pounds. Other castings up to 1000 pounds.

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Intake Manifold with Heater Body

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Gas Meter Valve Plate

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2500 WEST 27TH STREET
CLEVELAND 13, OHIO
Phone PRospect 5040

(*Continued from page* 188)

"A second basic problem in respect to steelmaking materials for 1948 is adequate supply of metallics. The problem has two parts, purchased or market scrap and iron ore.

Scrap in Tight Supply

"As regards market scrap, its tight supply and unsatisfactory quality was a major reason for the industry's inability to get more ingot output from existing capacity in 1947. It takes longer to charge an open hearth with poor scrap and there is less tonnage per open hearth day. At this moment some furnaces are idle because they do not have scrap.

"How long such scrap conditions will continue is still an open question. Efforts are under way to bring in scrap from European war zones and from Pacific islands. Scrapping operations in the United States are being encouraged in every possible way. At best, neither of these activities holds out hope for more than temporary relief. But full utilization of 1948 steelmaking capacity will call for substantially more scrap than has been available in this past year of uncomfortably tight supply. It looks now as if the problem of getting enough scrap of satisfactory quality will continue to tax the ingenuity of steelmakers as long as the rate of operations remains at its abnormally high level."

"AN INTRODUCTION TO JOB EVALUATION"

From a practical standpoint, job evaluation can be a positive force in better employee relations by providing a logical basic for promotions and transfers, as well as by assuring employees that their time and talents are not being wasted and that they are receiving equal pay for equal work.

This is one of the facts pointed out by the report, "An Introduction to Job Evaluation," which has just been published by the Policyholders Service Bureau of the Metropolitan Life Insurance Company.

Purpose of this report is to give executives of Metropolitan Group-insured companies a simplified explanation of job evaluation from the practical standpoint of the problems faced by management. It points out the reasoning processes on which job evaluation is based, requirements for a successful program, the steps involved, and the pitfalls commonly encountered. Although evaluation methods are briefly described, the report—as indicated by its title—is not intended as a detailed description of specific techniques.

Among the subjects covered by the report are: background of job evaluation, methods of job evaluation, basic thinking processes, organizing for job evaluation, steps in job evaluation, pitfalls, job evaluation in the small company, and informing employees on job evaluation.

Copies of the report are available to executives who request them on their business stationery. Address: Policyholders Service Bureau, Metropolitan Life Insurance Company, One Madison Avenue, New York 10, N. Y.

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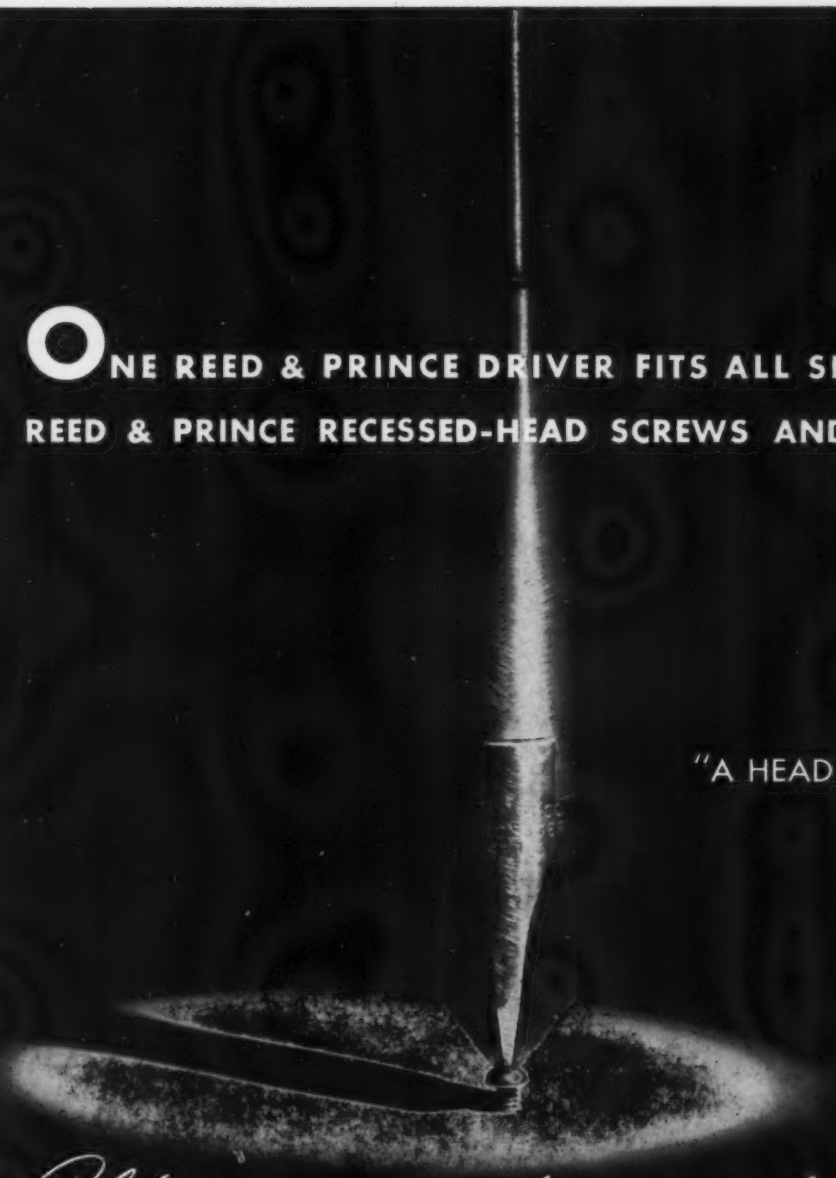
ONE REED & PRINCE DRIVER FITS ALL SIZES OF
REED & PRINCE RECESSED-HEAD SCREWS AND BOLTS



"A HEAD of the times"

Why waste time changing drivers?

All recessed-head screws and bolts have definite advantages over the older slotted head, but the Reed & Prince type Recessed-Head is the only one which can be fitted and driven throughout the entire size range with a single driver.

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MANUFACTURING CO.
WORCESTER, MASS. CHICAGO, ILL.

Manufacturers of Recessed and Slotted Wood Screws, Sheet Metal Screws, Machine Screws, Stove Bolts. Also Cap Screws, Set Screws, Machine Screw Nuts, Wing Nuts, Rivets and Burrs, Rods, Screw Drivers and Bits, Specialties.

Take a tip from:

The PURCHASING cameraman snaps Mr. A. M. Callis (left), Sales Manager Federated Metals Div., of American Smelting and Refining Company, discussing brass and bronze ingot and bearing alloys with Mr. A. G. Mould, P. A. of the Cleveland Graphite Bronze Co., one of the world's major manufacturers of precision bearings.

"The P.A. decides who gets the order."

"THROUGH THE YEARS I have spent in industrial selling I have seen the P.A. grow in importance as a factor to the point where today he is definitely the man who decides who gets the order," states Mr. A. M. Callis, Sales Manager of Federated Metals.

"It is the P.A. who must keep informed about available sources of supply that can meet his company's requirements. Of course, quality, availability of product, and price are the basis on which he places an order, and the task for both salesmen and advertising men is to see that the P.A. has the facts about the product."

Federated Metals doesn't gamble in carrying out this assignment. The company MAKES SURE the P.A. gets the facts by means of a dominating program in *Purchasing.*

Since the Purchasing Agent is a busy man, he can't read many magazines, but his own magazine, *Purchasing,* goes straight to his office without detours—stays with him for reference and use. It's the *one* magazine he *always* reads . . . the place where your advertising is certain to reach him. That's why *Purchasing* is a "must" on well-balanced advertising schedules.

For full facts, write *Purchasing,* 205 East 42nd St., New York 17, N. Y. Offices in Chicago, Cleveland, Los Angeles.

PURCHASING

ABC ABP

A CONOVER-MAST PUBLICATION

THE NATIONAL MAGAZINE FOR PURCHASING EXECUTIVES

"Front Door Business..."

The soundest and most fundamental principle in selling to industry today lies in selling through the "front door" — through the office of the Purchasing Agent.

Most successful Sales Managers like Mr. Callis know this, but just to make sure that every one of America's Sales Executives know it — and that nobody forgets it — the publishers of your magazine "Purchasing" run advertisements like the one opposite, in the key marketing magazines of the country.

These advertisements cover more than 40,000 men responsible for the sales and advertising of Industry's leading manufacturers.

LISTEN!
You need me to do a safe, efficient, economical job of removing extra heavy incrustations of dirt, grime, grease, oil, etc.
Lightfoot
INTEGRATED SOAP
SKIN CLEANSER
COMMODORE
COARSE GRIND FOR EXTRA HEAVY DUTY

IT'S INTEGRATED!

Scrubber and soap welded to form a single, integrated, indivisible unit . . . each particle a complete cleanser in itself.

. . . and for general plant use, I'm the most popular soap made. Your women workers will love me also!
Lightfoot
INTEGRATED SOAP
SKIN CLEANSER
TREET
FINE GRIND FOR HEAVY DUTY

As makers of fine quality soaps for over forty years, we present this exclusive Lightfoot process as a major advance in cleansing safety, efficiency and economy.

LET US PROVE IT!

Send for FREE TRIAL SAMPLE TODAY!

LIGHTFOOT SCHULTZ COMPANY
663 FIFTH AVE., NEW YORK 18, N. Y.

Please send us FREE trial sample of:

COMMODORE—a coarse grind soap for extra heavy duty . . . ☐

TREET—a fine grind soap for heavy duty . . . . . ☐

Firm_____

Individual_____

Address_____

City_____ State_____

THERE IS A LIGHTFOOT CLEANSER AND SKIN CONDITIONER FOR EVERY INDUSTRIAL APPLICATION

NICKEL-MANGANESE STEEL FOR REPAIR OF WEARING AREAS

Simple, cost-saving repair or build-up of large wearing areas is said to be possible with austenitic nickel-manganese steel plates now offered by the American Manganese Steel Division of American Brake Shoe Co., Chicago Heights, Ill.

Torch cut to desired size or shape and welded on with Amsco nickel-manganese steel rods or electrodes, the impact and abrasion resisting plates are described as providing restoration of worn manganese steel or ferrous areas, and pre-installation protection of ordinary ferrous parts at points subject to wear. Applications include wearing areas of chutes, jaw crusher cheeks and liners, dipper fronts, sides and doors, dragline bucket bottoms, and surge bins.

The plates are available ¼", ⅜", ½", ⅝", ¾", or 1" thick either in the standard 4' x 12' size, or cut to order.

NEW USES FOR INDUSTRIAL GASES DEVELOPED AT AIRCO LABORATORY

New uses for the industrial gases in the production and finishing of steel products are among the research activities now being conducted by Air Reduction Co. at its new apparatus research laboratory in Murray Hill, Charles S. Munson, president, revealed recently.

Air Reduction Company's new research laboratory.

The injection of industrial gases into molten metals, the oxyacetylene cutting of steel while the metal is still hot and surface-conditioning of stainless steel are among the laboratory's developments on which applied research is being pushed in an effort to help industry improve its products, cut production time, and reduce operating costs, according to Mr. Munson.

DECORATIVE MICARTA AVAILABLE IN NEW COLORS AND PATTERNS

Decorative Micarta, a high pressure laminate, is now available in a variety of new colors and patterns, the United States Plywood Corporation announced.

Mother-of pearl and linen patterns in gray, blue and tan have been developed together with Mahogany, Prima-Vera, walnut and Tru-Wood to fit into any color scheme, Willard F. Greiner, manager of the corporation's Micarta division said.

Decorative Micarta is manufactured by the Westinghouse Electric Corporation and distributed exclusively by the United States Plywood Corporation. It resists abrasion, acids, alcohol and a heat up to 280°F. It is also made in a special cigarette-burn-proof grade.

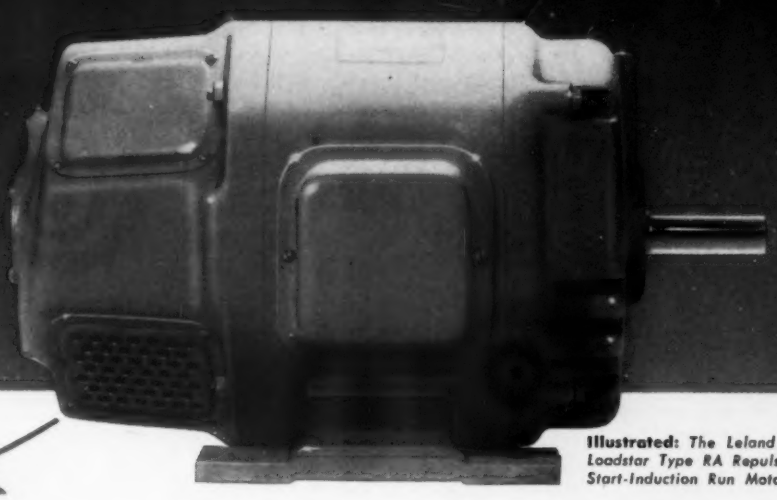
(*Please turn to page* 196)

Darnell Casters

It's easy to select the right caster to meet your exact requirements from the Darnell line. There are nearly 4000 models from which to choose.

DARNELL CORP. LTD.
LONG BEACH 4, CALIFORNIA
60 WALKER ST. NEW YORK 13, N.Y.
36 N. CLINTON CHICAGO 6, ILL.

Hitch your Product to a Leland LOADSTAR



Illustrated: *The Leland Loadstar Type RA Repulsion Start-Induction Run Motor.*

PICKUP! *Higher starting torque per ampere of starting current characterizes Type RA Repulsion start-induction run motors.*

QUIET! *Exceptionally close tolerances eliminate vibration, prolong motor life. Engineered throughout for smooth, silent operation under most exacting conditions.*

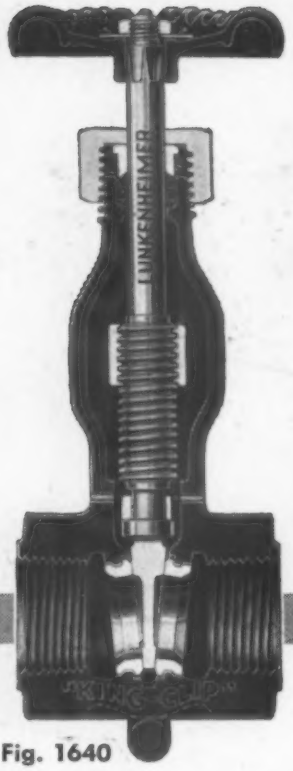
SELECTION! *1/2 to 5 HP. Types—ball bearing and sleeve bearing; open and enclosed; explosion-proof; horizontal and vertical.*

TOGETHER, they'll go far. If your product, too, stands for down-to-earth engineering aimed at standards raised sky-high, then you'll find your performance values enhanced by similar characteristics in the Leland Loadstar. Sales-wise, too, you'll find the nameplate on your Loadstar a potent business beacon. Your customers who have long known Leland, find in Leland Loadstars the coolest-running, sweetest Lelands yet . . . Specify Loadstar for HP per cubic inch as high as any—for HP per pound higher than most. *Write for descriptive literature.*

THE LELAND ELECTRIC COMPANY, DAYTON 1, OHIO. ***Branches in all principal cities.***

LELAND LOADSTAR MOTORS

MOTORS OF ALL TYPES—ENGINEERED TO INDUSTRY'S SPECIFIC NEEDS



YOUR VALVE DOLLAR *Goes Farther—*

with LUNKENHEIMER "KING-CLIP" VALVE

Fig. 1640

The Lunkenheimer "King-Clip" Valve has one quality feature after another... from the coarse, heavy stuffing box threads and hex-head gland which minimize stuffing box troubles... to the heavy body which resists wrenching and piping strains... and the heavy rust-proofing treatment, inside and out. Each feature adds longer life, lower maintenance and better service, wherever small and medium sized gate valves are used.

Note the ample, unobstructed drain channels and bronze thread bushing, features originated by Lunkenheimer, as was the "King-Clip" Valve itself. The Lunkenheimer "King-Clip" Valve is truly the king of all clip type valves... widely used for more than 50 years and, today, better than ever for longer, low-cost service.

ESTABLISHED 1862

THE LUNKENHEIMER CO.

"QUALITY"

CINCINNATI 14, OHIO, U. S. A.

NEW YORK 13 CHICAGO 6
BOSTON 10 PHILADELPHIA 34

EXPORT DEPT. 318-322 HUDSON ST., NEW YORK 13, N. Y.

Manifold employing multiple Lunkenheimer "King-Clip" Gate Valves. Note the compactness of the installation and the convenience of the bolted bonnets, each of which is readily accessible. "King-Clip" Gate Valves are furnished in 21 standard types, with iron body-bronze trim, all-iron or iron body-alloy trims and with inside or outside rising stems for various service needs.

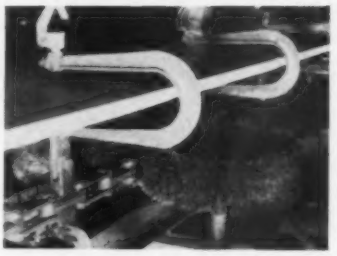
ASK YOUR DISTRIBUTOR

Consult your valve specialist, the friendly near-by Lunkenheimer Distributor. He has a stock of "King-Clip" Valves as well as other fine Lunkenheimer products. Ask for Bulletin 561 which details the 21 standard types of "King-Clip" Valves.

CARBOXYMETHYLCELLULOSE FOR PAPERBOARD PACKING

Added internal and surface strength to paperboard and added resistance to penetration of oils and waxes in paperboard is imparted by Hercules CMC, sodium carboxymethylcellulose, according to the Hercules Powder Company's Paper Makers Chemical Department, Wilmington, Del. The added resistance to penetration of oils and waxes in paperboard results in higher quality gloss ink printing and a saving in ink and wax, it is said. CMC is a free-flowing white, granular powder. It can be added at the calendar stack or size press and may be used separately or in conjunction with conventional surface treating materials such as starch, wax, and wax-resin emulsions.

SIMPLE BRUSHING SETUP DESCALES CONVEYOR CHAIN



The circular wire brushes eliminate scale, grease and dirt deposits.

A unique power brushing technique that reduces conveyor chain maintenance costs and offers substantial savings in operating and other maintenance efficiency, is being used in the refrigerator plant of the General Electric Co., Erie, Pa.

The setup is designed to eliminate the problem of scale deposits on the conveyor chain which passes through a rust-proofing solution at one stage of the assembly process. The chain, said to be one of the longest in the country, travels at the rate of 27 feet per minute. Heretofore it has been necessary to halt production periodically, remove the chain from the conveyor and clean it in a caustic solution.

Two Osborn disc-center circular wire brush sections, 15" in diameter and containing .014 wire, are mounted on each side of the chain to contact it just after the chain emerges from the bonderizing bath. Not only does the set up clean off the scale deposits, but also excess grease, oil and dirt which accumulate in regular service.

No special power mechanism is required for the brushing operation, as the brushes revolve with the chain, cleaning it continuously as the line moves. In most production line operations, it is pointed out, it is difficult to enclose the chains to protect them. The flexibility of power brushing, however, enables it to meet almost any cleaning problem. Among other things it can be set up to eliminate production stoppage to facilitate cleaning.

(*Please turn to page* 198)

LION NATURALUBE D.H.D.

OIL FOR DIESEL AND HEAVY DUTY MOTORS

Basically Different 4 WAYS*

1 REMOVES HARD CARBON

Nature gave Naturalube remarkable carbon-removing ability. This oil takes harmful carbon off rings, pistons, valves and plugs while the engine runs . . . cuts power-loss and wear.

2 STRONGER PROTECTIVE FILM

The naturally tougher film of Naturalube stands up under the heat and shock of heavy duty operation . . . provides increased protection for motor parts.

3 GREATER PENETRATION AND ADHESION

Naturally greater penetrative qualities assure constant lubrication of close-fitting parts. Naturalube's greater clinging power assures lubrication from the moment the engine starts.

4 NON-CORROSIVE—SAFE

Naturalube does not contain nor form substances injurious to bearings and other metal surfaces. It's naturally safe!

***RESISTS FORMATION OF SLUDGE**

Lion especially reinforces Naturalube D.H.D. to make it resistant to formation of harmful sludge and lacquer . . . to keep motors cleaner.

GUARANTEE

If you don't believe that Naturalube D.H.D. is the best oil you have ever used, Lion Oil Company will give you your money back!

Ask your Lion Distributor for complete information about D.H.D. or write to Lion Oil Company, El Dorado, Arkansas.

"Petroleum Promotes Progress"

LION

LION OIL COMPANY, EL DORADO, ARKANSAS

PACKAGING IS A BROAD CLASSIFICATION

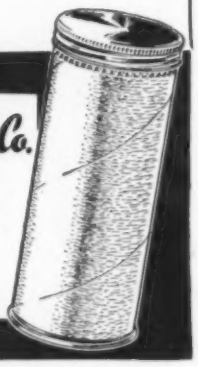
If your approach to it is along scientific lines, you will wish to contact and use the service of our Creative Design Dept.

Information on the right type of package, its advantages in design—in construction—in low costs—in permanency, etc., will be quickly furnished for your consideration.

The Cleveland Container Company, with over twenty years of experience in this field, merits your inquiries . . . gives quick and intelligent service in furnishing the data you desire.

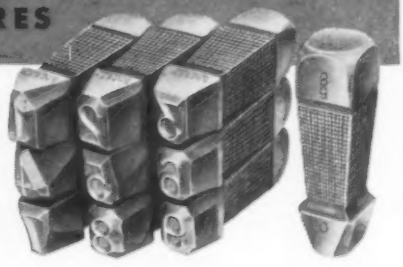
Besides the Packaging products mentioned below, we manufacture Cosmalite Tubes for Television Deflection Yokes and other Cosmalite products for use in the Electronic field.

Quality Products . . . rightly priced . . . rapidly produced. May we serve you?



The CLEVELAND CONTAINER Co.
6201 BARBERTON AVE. CLEVELAND 2, OHIO
• All-Fibre Cans • Combination Metal and Paper Cans
• Spirally Wound Tubes and Cores for all Purposes
• Plastic and Combination Paper and Plastic Items
★ ★ ★
PRODUCTION PLANTS also at Plymouth, Wisc., Ogdensburg, N. Y., Chicago, Ill., Detroit, Mich., Jamesburg, N. J. PLASTICS DIVISION at Plymouth, Wisc., Odgensburg, N. Y. • ABRASIVE DIVISION at Cleveland, Ohio. • N. Y. SALES OFFICE — 1106 Broadway, Room 223 • IN CANADA — The Cleveland Container Canada Ltd., Prescott, Ontario.

For Maximum Safety in Stamping—
"SAFETY" Wedge Grip
STEEL LETTERS AND FIGURES



PERFECT balance . . . Knurled sides not only assure *positive* grip with "Wedge Grip" to give clearer, deeper impressions—but also lessen severity of extra heavy stamping. Characters available from 1/16" to 1".

- No mushroom
- No spall
- 25% to 50% more service
- More Safety!
- Pat. No. 2,089,794

Write for Bulletin J-547

M.E. CUNNINGHAM CO.
SAFETY-STEEL STAMPS
154 E. Carson Street Pittsburgh 19, Pa.

FORMING ALUMINUM ON DIES USED FOR OTHER METALS

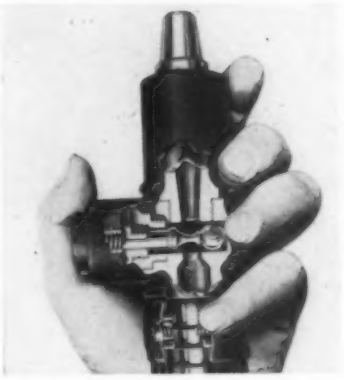
Aluminum can be substituted for the same thickness of most any other metal and blanked, formed, or drawn in the same dies as used for the other metal, says the Reynolds Metals Company' Technical Advisor. In some instances die radii and clearances may have to be modified slightly by reworking the dies.

Where the aluminum must have the same rigidity as the steel part, it is necessary to use a thicker blank. However, the same dies can still be used if the part is merely bent or formed, not drawn. Where drawing is involved it will be necessary to increase the die cavity by removing some steel from the die surfaces in order to allow the proper clearance between punch and die in the wall areas.

If the aluminum does not perform right in the dies, it may be because the incorrect alloy or temper is being used, or improper tool adjustment. The material may crack if too hard; buckle if too soft.

* * *

NEW HOSE VALVE SAVES WATER



The only moving parts are the plunger and the control ball.

New palm-size, hose valve of new design that gives full control with only two moving parts, and which is said to cut water consumption in some plants as much as 50%, is announced by Paul Valve Corporation, 683 Third Ave., New York, N. Y.

It operates without springs and with only two moving parts—the operating plunger and the controlling ball. It is discharged by pushing a button which causes the plunger to roll the ball off its seat, giving instant full flow. When the push button is released, the difference in pressure between the center and the outside of the stream forces the ball into the valve throat, closing the valve and raising the push button plunger. The ball is held firmly against the seat by line pressure, making a line-contact seal.

The valve is available for standard hose sizes from ¼ inch to 1 inch, delivering up to 13 gallons per minute at 75 lbs. psi line pressure. The valve, including ball and plunger, is made of monel, and the body is rubber coated.

(*Please turn to page* 200)

ARE YOU USING THE

Aluminum Know-How

AVAILABLE THROUGH YOUR ALCOA DISTRIBUTOR?

Know-how is an important part of every distributor's sale of Alcoa Aluminum. For your Alcoa Distributor is a specialist—ready to aid you with your own problems of utilizing Alcoa Aluminum in the most convenient and economical form possible.

And back of your Alcoa Distributor stands Alcoa's own engineering service, ready to help you work out your aluminum alloy problems of specification, fabrication, shop practice, or finish. This kind of help is readily available from the distributor nearest you. Make a note of his name and phone number now. ALUMINUM COMPANY OF AMERICA, 1931 Gulf Building, Pittsburgh 19, Pa. Sales offices in principal cities.

Atlanta, Georgia
J. M. Tull Metal & Supply Co., Inc.
Phone: WAlnut 3525

Baltimore, Maryland
Whitehead Metal Products Co., Inc.
Phone: LAfayette 2300

Buffalo, New York
- Brace-Mueller-Huntley, Inc.
Phone: RIverside 2620
- Whitehead Metal Products Co., Inc.
Phone: CLeveland 1475

Cambridge, Massachusetts
Whitehead Metal Products Co., Inc.
Phone: TRowbridge 4680

Charlotte, North Carolina
Edgcomb Steel Company
Phone: 4-9768

Chicago, Illinois
- Central Steel & Wire Company
Phone: REPublic 3000
- Steel Sales Corporation
Phone: BIShop 7700

Cincinnati, Ohio
Williams & Company, Inc.
Phone: CHerry 4700

Cleveland, Ohio
Williams & Company, Inc.
Phone: EXpress 7000

Columbus, Ohio
Williams & Company, Inc.
Phone: MAin 3291

Dallas, Texas
Metal Goods Corporation
Phone: DIxon 4-3925

Detroit, Michigan
Steel Sales Corporation
Phone: TYler 6-3000

Houston, Texas
Metal Goods Corporation
Phone: BEacon 3-8881

Kansas City, North, Missouri
Metal Goods Corporation
Phone: NOrclay 3516

Los Angeles, California
- Ducommun Metals and Supply Co.
Phone: KImball 0181
- Pacific Metals Co., Ltd.
Phone: PRospect 0171

Newark, New Jersey
Whitehead Metal Products Co., Inc.
Phone: BIgelow 8-8500

New Orleans, Louisiana
Metal Goods Corporation
Phone: CAnal 7373

New York, New York
Whitehead Metal Products Co., Inc.
Phone: WAtkins 9-4900

Philadelphia, Pennsylvania
- Edgcomb Steel Company
Phone: GArfield 3-6300
- Whitehead Metal Products Co., Inc.
Phone: BAldwin 9-2323

Pittsburgh, Pennsylvania
Williams & Company, Inc.
Phone: CEdar 8600

Portland, Oregon
Pacific Metal Company
Phone: BRoadway 0695

Rochester, New York
Brace-Mueller-Huntley, Inc.
Phone: GLenwood 0962

San Francisco, California
Pacific Metals Co., Ltd.
Phones: MIssion 7-1104
ENterprise 1-0806

Seattle, Washington
Pacific Metal Company
Phone: ELliott 2983

St. Louis, Missouri
Metal Goods Corporation
Phone: GOodfellow 1234

Syracuse, New York
- Brace-Mueller-Huntley, Inc.
Phones: SYracuse 4-4171 3-9151
- Whitehead Metal Products Co., Inc.
Phone: SYracuse 5-4112

Toledo, Ohio
Williams & Company, Inc.
Phone: ADams 8102

Tulsa, Oklahoma
Metal Goods Corporation
Phone: 4-1175

FIRST IN

ALCOA ALUMINUM

ALCOA ALUMINUM 1888 1948 60 YEARS OF SERVICE

"Brake Shoe Research serves you today and anticipates tomorrow"

Wm. B. Given, Jr., President

When your CASTING PROBLEMS feature ABRASION think of . . .

Preparing specimens for X-raying

X-ray diffraction apparatus

CASTINGS BY BRAKE SHOE of ABK Metal

If abrasion resistance and wear resistance are the prime requirements in the castings you use . . . ABK Metal provides the answer. This is especially true since ABK Metal is backed by American Brake Shoe Company's vast practical knowledge of metals and foundry techniques.

ABK Metal castings are subjected to the production controls of chemical analysis, hardness and mechanical testing, each of which is important. But the important key to their serviceability is struc tural control accomplished by fundamental microscopic and X-ray diffraction techniques. Careful piloting in a full-sized experimental foundry is followed by periodic checking in the production foundry to insure sound castings free from injurious internal stresses.

We welcome inquiries on any phase of your need for castings whether of ABK Metal (wear resist), Gray Iron or Meehanite® as made by Brake Shoe.

6316

AMERICAN Brake Shoe COMPANY

BRAKE SHOE AND CASTINGS DIVISION

230 PARK AVENUE, NEW YORK 17, N. Y.

DEVELOP PORCELAIN ENAMEL ADHERENCE TESTER

Testing apparatus for measuring the adherence of porcelain enamel to base metal by means of magnetic counting, has been developed by the Research Foundation of the Porcelain Enamel Institute in the National Bureau of Standards. The instrument was primarily designed to supplement the conventional fracture test for adherence and provide more complete data on the impact characteristics of porcelain enamels. Full information in regard to the tester and its application will be furnished by the Porcelain Enamel Institute, 1010 Vermont Ave., N. W., Washington 5, D. C.

OWENS-CORNING BUILDING DEMONSTRATES MANY USES OF GLASS FIBERS

In the walls are Fiberglas batts, covered by porous Fiberglas mat. Over this are perforated aluminum sheets.

The New York Fiberglas Building, recently opened by the Owens-Corning Fiberglas Corp. at 16 East 56th St., serves as a permanent demonstration of the wide range and numerous applications of glass in fiber form.

In open office area, Fiberglas finds many applications including use as chair covering.

More than a score of Fiberglas materials, ranging from air filters, thermal insulation batts, acoustical blankets and acoustical tiles, to glass yarns fabricated into curtains, wall coverings and upholstery fabrics, are used in the building, its equipment and its interior decoration. One interesting application is the installation of a membrane, consisting of a Fiberglas fabric impregnated with asphalt, between the limestone front of the building and the brick backing to make the

(*Please turn to page* 202)

HINES SHELF

A NAME TO REMEMBER

WHEN YOU BUY

Shelving

FOR LIBRARIES—STOREROOMS AND OFFICES

Schools and universities are finding that these strong, prefabricated shelving units meet the needs for additional book stacks at large savings in money. Made with a framework of clear Ponderosa Pine, fastened together with a patented, cadmium plated hardware bracket and with Masonite Temperd Presdwood to serve as shelves and ends, Hines-Shelves can be erected by unskilled labor. Everything comes to you, carton packed, ready for quick, easy assembly and the framework can be painted or stained to harmonize with any color scheme.

EDWARD HINES LUMBER CO.
2431 SO. WOLCOTT AVE., CHICAGO 8, ILLINOIS

IMMEDIATE DELIVERY—Standard starter and extension units measure 34 in. high, 36 in. wide, 11½ in. deep with 3 shelves; 36 in. by 11½ in. are ready for immediate delivery. Where quantities are large, special sizes will be made to order.

EDWARD HINES LUMBER CO.
2431 SO. WOLCOTT AVE., CHICAGO 8, ILLINOIS

Please send us name of nearest distributor and full information on Hines-Shelves.

Name.....

Address.....

City.....State.....

JG-129

PICK THESE BLADES

for LONGER CUTTING LIFE

For most economical production metal-sawing, pick the long-life GRIFFIN SPECIAL ALLOY. Molybdenum high speed steel. Machine and hand frame sizes.

To cut stainless, chrome, nickel and all other tough alloys, pick the GRIFFIN HIGH SPEED STEEL. 18-4-1 tungsten high speed steel. Machine and hand frame sizes.

For any hand-frame use, pick the tough all purpose NEW GRIFFIN. Flexible as a soft-back, durable as an all-hard.

For hand-cutting thinnest sheet, tubing, conduit, etc., pick the GRIFFIN NON-STRIP. Teeth don't snap out.

For precision contour cutting, pick GRIFFIN BAND SAWS. Four types for metal-cutting and wood-cutting.

Write for new 20-page Griffin Price List. Full descriptions, sizes, selection tables, etc.

General Sales Agent

JOHN H. GRAHAM & CO., INC.

Dept. C, 105 Duane St., New York 8, N. Y.

ASK YOUR DISTRIBUTOR FOR

GRIFFIN

HACK SAW BLADES *and* BAND SAWS

Made by G. W. GRIFFIN CO., Franklin, N. H., Hack and Coping Saw Blade Specialists since 1880

CULLMAN *Stock Design* SPROCKETS

will do the job—Better!

With many types to select from—you are almost certain to find just the size you need for practically every transmission requirement—*ready for immediate delivery.* Cullman Sprockets—produced by fast, low-cost, high-precision methods—assure top operating efficiency. "Specials," too, *are quickly available*—made up by exclusive Cullman methods and specialized equipment.

Write today for free catalog containing useful data and helpful facts for sprocket users. It lists dimensions.

CULLMAN WHEEL COMPANY

1352 P Altgeld Street — Chicago 14, Illinois

(*Continued from page* 200)

front waterproof. The membrane is also used as a flashing on the roof. The building is completely air conditioned, with banks of Fiberglas air filters employed to strain dirt and pollen from the air circulated by the system.

To deaden office noises, a number of acoustical treatments are employed. All ceilings are of the suspended type. The majority are of Fiberglas acoustical tile or Fiberglas acoustical board. A treatment employed in individual offices consists of Fiberglas sound-absorbing blankets laid on Fiberglas cord stretched behind Fiberglas fabric.

The entire second floor of the building is given over to a display area arranged to make clear what Fiberglas materials are, why they are used, what they are used for, and how they have been developed into what they are today. A large part of the first floor is given over to a display area where decorative fabrics woven of Fiberglas yarns, alone and with other yarns are shown. The third and fourth floors house the New York sales staff, and the fifth floor contains offices and a large conference room.

DIE-CASTING PROCESS FOR SMALL ZINC PARTS

A specialized process for the production of small zinc die castings has been made available to general industry by the Gries Reproducer Corp., 780 East 133rd St., New York 54, N. Y. This process, which covers tiny parts of ½ ounce maximum size, unlimited minimum size, is said to offer quick service and important economies to manufacturers.

The company can deliver quantities from 100,000 to millions, and has facilities for secondary operations, assembly and surface finishing, according to the announcement. Close tolerances are maintained where required, it is said. Samples of die castings and bulletin will be furnished on request.

REDUCES TENDENCY OF PAINTS AND VARNISHES TO SKIN

Two specialty solvents for paints and varnishes, Hercules Dipentene and Solvenol, are again in full supply according to announcement made by the Hercules Powder Co., Wilmington, Del. They are characterized as powerful solvents for most natural and synthetic resins and polymerized oils used in Oleoresinous finishes, and have a slow initial

(*Please turn to page* 204)

Why SANDVIK has so many different kinds of high carbon and alloyed steel

SANDVIK high carbon and alloyed steels are *specialized* steels. Each type is fitted for a specific service; "custom-tailored" to meet certain exacting physical demands.

Purity of raw materials, special analyses, highly developed techniques in processing and finishing — these are all factors in the production of specialized SANDVIK steels.

If you have an application that calls for unusual physical characteristics and quality in high carbon or alloyed strip steel, 'phone or write SANDVIK.

You can get Sandvik steels

- **In special analyses for specific applications**
- **Annealed, unannealed or hardened and tempered**
- **With bright finish or blue or yellow polished**
- **With round edges or square edges**
- **In a wide range of thicknesses from .001".**

You can get complete information, promptly, on request.

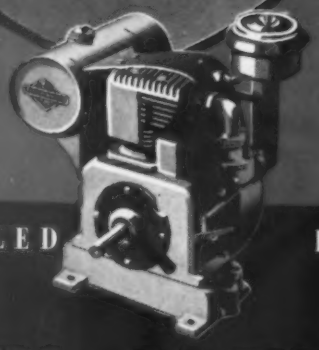
SS-24

SOME SANDVIK SPECIALTY STRIP STEELS
Band Saw Steels • Camera Shutter Steel • Clock and Watch Spring Steels Compressor Valve Steel • Doctor Blade Steel • Feeler Gauge Steel • Flapper Valve Steel • Knife Steels • Matrix Band Steel • Needle Cutter Steel • Piston Ring Segment and Expander Steels • Razor Blade Steel • Reed Steel • Shim Steel Shock Absorber Steel • Sinker Steel Spring Steels • Textile Steels • Vibrator Reed Steel

Sandvik Quality Steels

SANDVIK STEEL, INC.
111 EIGHTH AVE., NEW YORK 11, N. Y. WAtkins 9-7180
180 N. Michigan Ave., Chicago 1, Ill. FRAnklin 1745
1736 Columbus Rd., Cleveland 13, Ohio CHerry 2303
WAREHOUSES: New York and Cleveland

AUTHORIZED
4 CYCLE
BRIGGS & STRATTON
GASOLINE ENGINES
SERVICE



AIR-COOLED POWER!

World-Wide Service for Briggs & Stratton Engines

In the United States, Canada, and throughout the world, Briggs & Stratton maintains a vast network of *Authorized Service Stations*, operating under factory supervision and policies.

These stations offer complete engine service — unequalled in the industry — mechanics, factory trained to adjust, repair, or rebuild Briggs & Stratton engines with original parts. One more reason why Briggs & Stratton is "preferred power" by manufacturers, dealers, and users of industrial equipment, farm machinery, and appliances.

BRIGGS & STRATTON CORP., MILWAUKEE 1, WIS., U.S.A.

(*Continued from page* 202)

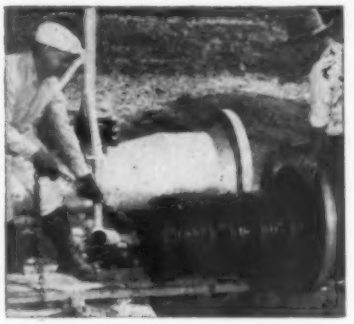
rate of evaporation which produces better flow and leveling properties. Both solvents are said to be useful also in the formulation of quick dry enamels and varnishes where they promote a thorough drying. They also act as excellent wetting agents for pigments.

Dipentene No. 122 also will reduce sharply the tendency of paints and varnishes to skin. Neither solvent has a deletorious effect on the color of varnish or enamel. No. 122 is a colorless liquid with a pleasant, lemonlike odor. It has a narrower boiling range and faster evaporation rate than Solvenol No. 1. Solvenol No. 1 is a slightly more powerful solvent. Both conform to U. S. Navy Specification 52-D-8.

* * *

OIL LINE SCRAPER

A new oil line scraper with excellent resistance to oil, wear, swelling and deterioration has been made by The Pioneer Rubber Company, of San Francisco, Cali-



fornia. The scraper is made from a series of ten 18½ by 1¾" Hycar American rubber discs mounted on a metal core and is shown being pulled from a crude oil pipeline after completing a 40 mile run with no damaging effects. The scraper is run through the pipe lines when excessive pumping pressures indicate the resistance of accumulated paraffin on the sides of the oil lines.

A scraper similar to the one shown was left in an oil trap for over three weeks with no apparent swelling.

Further information is available from G. B. Koch, B. F. Goodrich Chemical Company, Rose Bldg., Cleveland, Ohio.

IS YOUR PURCHASING DEPARTMENT UNDERSTAFFED? YOU CAN FIND JUST THE MAN (OR WOMAN!) YOU ARE LOOKING FOR BY GLANCING THROUGH THE CLASSIFIED COLUMNS . . . UNDER "POSITIONS WANTED".

SEE PAGE 334

We take our own medicine*

℞
AIR CONDITIONING FOR PRECISION MANUFACTURE
This modern windowless plant near Boston is divided into six zones, each served by a separate air conditioning system. In order to maintain ideal conditions for machining of precision products, cleanliness, humidity and temperature are carefully controlled in each zone. An added advantage of the G-E Air Conditioning System is the overall good working conditions conducive to high quality workmanship.

Industry after industry is learning that production can be more efficient, quality control more precise when effective air conditioning is provided.

In the plant shown above for instance, heat loads vary widely within the building. Consequently, a battery of multiple condensing units totalling 1100 HP offers economic and operating benefits.

General Electric Distributors or Contractors can "tailor" an air conditioning or refrigeration system to meet your particular need. An abrasive manufacturer needs low humidity . . . a quality control laboratory needs precise control of conditions to test samples . . . a precision assembly line needs constant temperature for proper mating of component parts. Any of these conditions can be met effectively and economically with G-E Air Conditioning equipment.

It has been found by G-E engineers that the conditions required for most industrial processes provide at the same time adequate conditions for comfort and good working conditions. This makes it possible for human and mechanical requirements to be considered together. Read the free booklet offered below for further information—or call your G-E Distributor or Contractor.

GENERAL ELECTRIC

Industrial Refrigeration and Air Conditioning

Get this FREE book

"New Industrial Dimensions" describes 17 important applications . . . gives photos and diagrams of basic heat transfer methods.

General Electric Co.,
Air Conditioning Dept., Section 8293
Bloomfield, N. J.

Please send me FREE copy of the General Electric book "New Industrial Dimensions."

Name_____

Address_____

City_____ State_____

TAPES THAT ARE TOPS IN...

In all four of these major properties, PANTHER and DRAGON Rubber Tapes pass A.S.T.M. and other government specification tests with generous margins of safety. And they produce the kind of splices that are expected of such high-rated tapes. PANTHER and DRAGON Rubber Tapes assure safe electrical splices. Successive layers of tape readily fuse into one. Their tensile strength and "stretch-ability" make them unfailingly easy to work with. Manufactured by a company that has specialized in electrical insulation for nearly 70 years, PANTHER and DRAGON Friction and Rubber Tapes are sold only through recognized independent wholesalers. Hazard Insulated Wire Works, Division of The Okonite Company, Wilkes-Barre, Pa.

5170

Panther and Dragon
friction and rubber tapes

AUTOMATIC GAGING MACHINE

The "Airlectric" automatic gaging machine that checks the average outside diameter of shock absorber pistons and segregates them into eight classes at the rate of 3,600 per hour has been developed by Sheffield Corp., Dayton, Ohio. After the pistons are ground on a centerless grinder they go to the gaging machine where they are placed in a chute at the bottom of which they pass under an "Electrichek" gaging head which actuates devices that automatically reject excessively oversized parts. These may later be salvaged and reground.

The remaining parts are removed from the gaging station and inserted in a tungsten carbide air ring which is connected to a series of "Airlectric" gaging heads that determine the size of the part, indicating such by the lighting of one of a series of signal lights. This only occurs if the part is within the minimum and maximum tolerance limits. Pistons are expected from the air ring, and, depending on size, pass into the corresponding receptacle. Each piston is segregated and classified as to undersize, oversize, or one of the five acceptable classifications.

PLASTIC CONTAINERS FOR STORAGE OF PAINT BRUSHES

Plastic airtight and liquid-tight containers, announced by The Goodyear Tire & Rubber Co., are said to eliminate messy paint brushes in open cans of solvent.

The "Brush-away" containers, made of Pliofilm, permit the storage of brushes with or without cleaning, the oil in the residue paint itself keeping the bristles soft and pliable, it is said. An elastic band at the top of the container keeps it airtight and at the same time provides a loop with which the container may be suspended; this feature keeping the brush weight off the bristles, thus eliminating spreading.

The containers are produced by the Merryweather Products Co., Akron, O. The company states that they have successfully withstood exhaustive tests with a variety of coatings, the Pliofilm resisting all chemical reactions, keeping the brushes in instant usable condition.

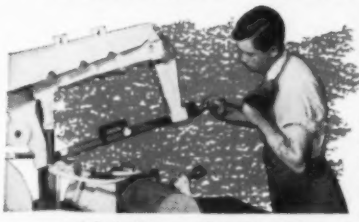
Conventional procedures of cleaning brushes after each use and their storage in messy cans of solvents, are claimed to be eliminated by the container.

(*Please turn to page* 208)

NEW SIMOMETER

gives you accurate TESTED TENSION in less than 1 minute per blade

Here's how SIMONDS Quick and Easy Tensioning Method gives you LONGER BLADE LIFE!



Avoid Undertension which causes crooked cutting, spoiled work, lost time.

Avoid Overtension which causes blade-vibration, rapid dulling of teeth, frequent blade-breakage.

Slip the *Simometer* Directly over Blade, tighten two thumbscrews . . . now put tension on blade until **Simometer** needle moves into green zone . . . and you *can see at a glance* you have the right tension on the blade.

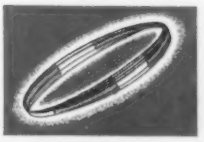
Then You're Set to get Faster, Straighter Cuts... and more cuts per blade... *the full measure* of performance which **SIMONDS** "Red End" Power Blades are made to give you. Ask your distributor.

BRANCH OFFICES: 1350 Columbia Road, Boston 27, Mass.; 127 S. Green St., Chicago 7, Ill.; 416 W. Eighth St., Los Angeles 14, Calif.; 228 First St., San Francisco 5, Calif.; 311 S. W. First Avenue, Portland 4, Ore.; 31 W. Trent Ave., Spokane 8, Washington. *Canadian Factory:* 595 St. Remi St., Montreal 30, Que.

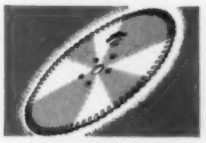
SIMONDS ALSO MAKES:

FLAT GROUND STEEL STOCK (Oil Hardening)

"RED TANG" FILES



METAL-CUTTING BAND SAWS (Regular Hard Edge, Skip-Tooth, Spring Temper)



CIRCULAR METAL-CUTTING SAWS (Inserted-Tooth, Segmental, Solid-Tooth)

SIMONDS SAW AND STEEL CO.
FITCHBURG, MASS.
Other Divisions of SIMONDS SAW AND STEEL CO. making Quality Products for Industry

SIMONDS STEEL MILLS — Special Electric Furnace Steels
SIMONDS ABRASIVE CO. — Grinding Wheels and Grains
SIMONDS SAW AND STEEL CO. — Simonds Products for Canada

SIMONDS "Red End" HACKSAW BLADES

WHEN YOU USE SIMONDS YOU STAY IN THE HIGHLANDS . . . OF CONSISTENT CUTTING EFFICIENCY

What STRONGER Proof
CAN YOU ASK FOR
as to the quality of the product,—the responsibility and dependability of the firm, than the almost Century of Continual Activity of this Company in the manufacture of
BOLTS
NUTS • SCREWS
and RIVETS?
They are obtainable through your Jobber and Mill Supply House
SPECIFY AND DEMAND BY NAME
CLARK
• • • • •
CLARK BROS BOLT CO.
MILLDALE CONN.

STAY ON THE JOB
with
MOXSAN FINGER PROTECTORS

Moxsan protects not only the front of fingers, but *both sides* with durable leather that's seamless on all wearing surfaces. Elastic web back provides cool, comfortable fit. Tapered cut gives freedom of movement. Essential for handling rough or sharp articles, for buffing, grinding, sanding, polishing, punch press work and hundreds of other jobs. Fits all fingers. Available in 3 types of leather for men and women: heavy duty (7394), medium duty (8384), fine work (9346). Send 10c for sample or $6.48 for a box of 72 . . . today!

FREE: *Special circular illustrating full line of finger protectors and illustrated catalog of safety work gloves and safety apparel*

OLYMPIC GLOVE COMPANY Inc.
95 Madison Ave., Dept. 9, New York 16, N. Y.

WETTING AGENTS IN FIRE SERVICE

Some recent articles have brought to the attention of many people that certain chemicals added to water result in breaking down the surface tension of water, thus making it a "wetter" liquid. These chemicals cause the outer surface or "skin" of the water to break through with greater ease, and in this manner permit the water to penetrate into objects more readily.

The principal value of water in extinguishing a fire is its cooling effect. Cooling is obtained largely by absorbing heat from the burning material, and the major part of this takes place when the liquid is turned into steam vapor. The mass of water that actually contacts the burning material is what really counts, and wetness usually increases this area of contact, and consequently the rate of heat transfer. Quantity of water and ability to deliver it to the seat of the fire are two main factors in combating any major fire. The lowering of the surface tension of the water may result in a very broken stream, even with a smooth bore nozzle, and therefore it is questionable whether wet water is desirable in every type of fire fighting.

For the small fire, or the fire which smolders and bores within a quantity of combustible material, or fires where upper charred layers (presence of water

(*Please turn to page* 210)

Now A BENCH PRESS FOR ONLY $25.00

THE NEW AMP
AMPli-press

SMALL • PRACTICAL • INEXPENSIVE

Handy, efficient foot-operated press for installing AMP solderless electrical terminals and other light press operations* in plants of any size.

"AMPli-Press" offers advantages of press installation of AMP terminals at hand-tool cost. Produces same uniform, vibration-proof solderless connections as AMP power tools. Only difference is in production speeds. Ideal for harnesses, repair work, maintenance and other limited production jobs. Easy to operate. Nothing to get out of order. Requires only 7 sq. in. of bench space. Uses interchangeable crimping heads for various AMP terminal types and wire sizes. Heads available for AMP "Solistrand," "Pre-Insulated," "Diamond-Grip," "Plasti-Grip," and "Budget" terminals. Wire sizes 22-10.

*Easily adaptable for shearing, crimping, cutting, riveting, eyeletting, punching, etc.

AIRCRAFT-MARINE PRODUCTS Inc.
1319 NORTH FOURTH STREET, HARRISBURG, PA.
Sole Canadian Representative:
F. MANLEY & SONS, LTD., 82 Adelaide St., E., Toronto, Ont., Canada

ARMSTRONG

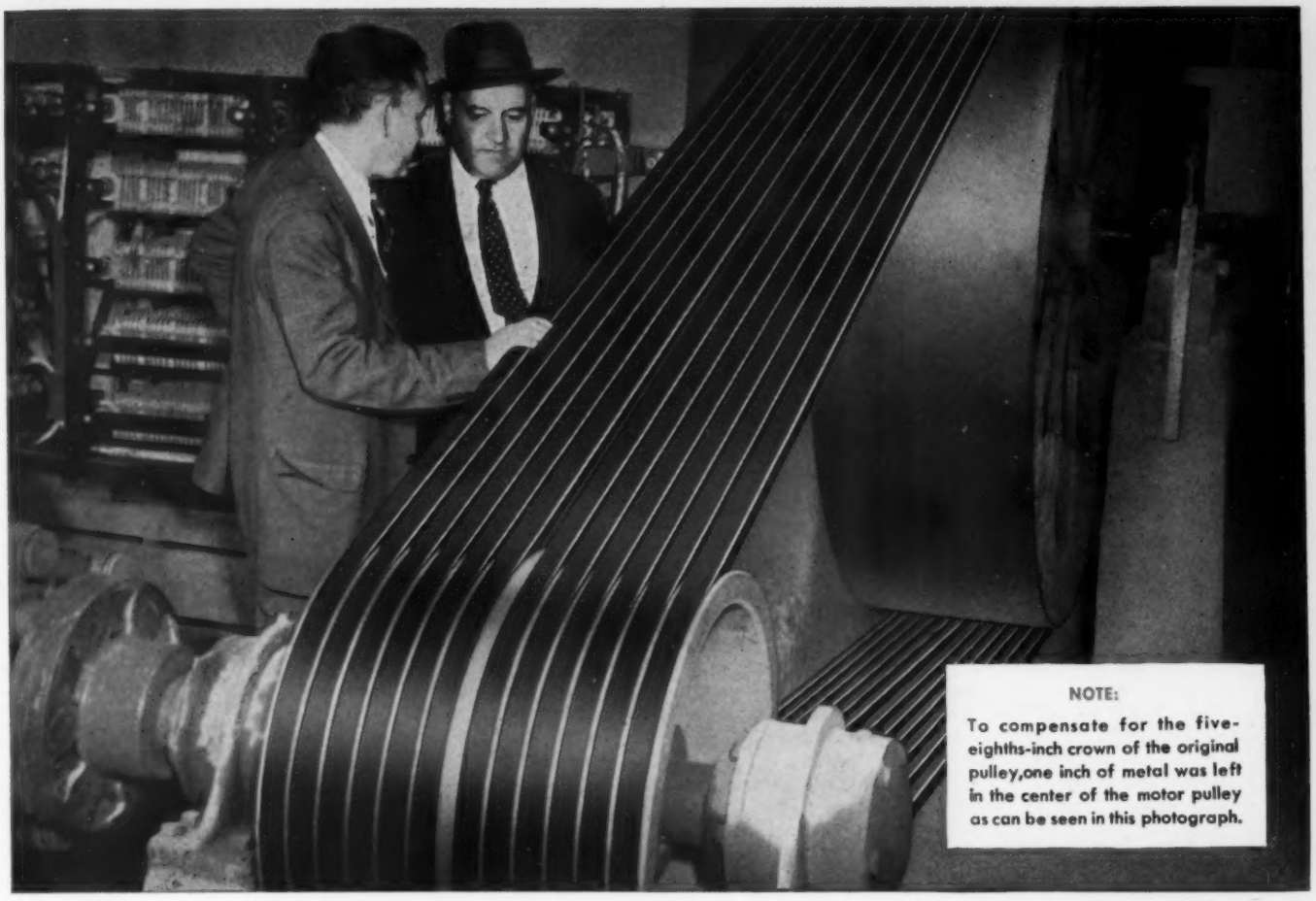
New TOOL HOLDERS

MAKE MORE PROFIT ON *EVERY* OPERATION

With ARMSTRONG TOOL HOLDERS you can take advantage of the new high speeds and heavier feeds of the newer cutting materials, without revolutionary changes or costly experimentation. They are the most profitable tools obtainable; the lowest in initial cost, the longest in service and most economical in use, for all incorporate the basic Armstrong Principle of small interchangeable cutter-bits in permanent drop forged shanks. They are the most readily obtainable tools too, for they are stocked by all leading distributors.

Write for circulars describing:
(1) ARMSTRONG Carbide TOOL HOLDERS and ARMIDE (Carbide Tipped) Cutters.
(2) ARMSTRONG C A TOOL HOLDERS and ARMALOY (Cast Alloy) Cutterbits.

ARMSTRONG BROS. TOOL CO.
"The Tool Holder People"
5203 W. Armstrong Ave., Chicago 30, U.S.A.
New York **San Francisco**


NOTE:
To compensate for the five-eighths-inch crown of the original pulley, one inch of metal was left in the center of the motor pulley as can be seen in this photograph.

POWER PLANT EXPENSE REDUCED OVER $3,000 ANNUALLY

Boilers and machinery in the power plant of a large Central Ohio clay products manufacturer were badly in need of repairs. To replace worn-out equipment called for large capital expenditures and even with new equipment, estimated operating expenses loomed large. The manufacturer turned to his local Dayton V-Belt Distributor for suggestions. He recommended replacing the original prime mover with a 250-HP electric motor. This eliminated the necessity of replacing and operating the worn-out boilers. Further, though only 13 feet of floor space were available, the Distributor worked out a Dayton V-Belt short-center drive that made use of the original, flat, 8-foot-diameter pulley without removing the $\frac{5}{8}$-inch crown.

In the first year of operation, the new motor and drive reduced power plant operating costs over $3,000!

Your own local Dayton V-Belt Distributor can give you similar help with your power transmission problems. With his specialized knowledge he can eliminate nearly 95 per cent of all power drive troubles using standard Dayton V-Belts and the power drive accessory equipment he stocks. If necessary, he can quickly secure the aid of a Dayton power transmission specialist. So, for prompt, profitable solutions to your drive problems call your local Dayton V-Belt Distributor.

THE DAYTON RUBBER COMPANY
Main Office and Factory: Dayton 1, Ohio
Branch Offices: Atlanta, Boston, Chicago, Cleveland, Dallas, Detroit, Los Angeles, Minneapolis, New York, Philadelphia, St. Louis

V-Belt Buyers! A leading mill supply house near you offers specialized Dayton V-Belt service. Look for the name under the trade name heading "Dayton V-Belts" in the yellow pages of your telephone directory.

Dayton Rubber

THE MARK OF TECHNICAL EXCELLENCE IN NATURAL AND SYNTHETIC RUBBER

PAGE

Stainless Steel WIRE

● ROUND

FLAT

OR

SHAPED

"Page for Wire— Especially Stainless"

Remember that the next time you are looking for a responsible source for stainless steel wire. Wire has always been the business of PAGE. And ever since its earliest development, PAGE has been working with stainless.

Whatever problem you may have involving wire—

Get in touch with Page!

ACCO

Monessen, Pa., Atlanta, Chicago, Denver, Detroit, Los Angeles, New York, Pittsburgh, Philadelphia, Portland, San Francisco, Bridgeport, Conn.

PAGE STEEL AND WIRE DIVISION
AMERICAN CHAIN & CABLE

In Business for Your Safety

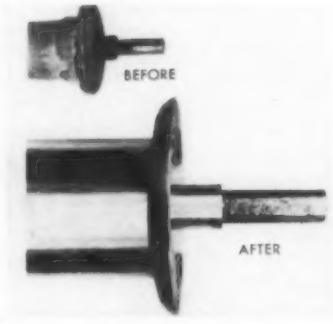
(*Continued from page 208*)

repellent distillates and tarry residues) of material may reduce the penetration of water, the use of wet water will prove advantageous. It undoubtedly will be of much value in brush or grass fires, especially, where there is an accumulation of "duff".

"Wetter" water, especially in connection with spray or fog nozzles, may, under proper handling, materially reduce water damage; this applies particularly to an interior fire of such a character that it can be attacked with the relatively short reach available in fog streams. The greater penetrating absorption provided by the wetting agency means less run-off on to floors and less damage to contents. Except for the increase in penetration "wet" water has no greater extinguishing value than ordinary water.

A number of various wetting agents are now being marketed. They are organic compounds and are not all of the same formulation, thereby requiring varying concentrations for use. Before adopting any compound for this purpose, a full knowledge should be obtained as to any chemical reaction which might be brought about in their use, and especially whether it is of a electro-conductive, corrosive, toxic, or oxidizing nature. A comparative evaluation of these materials under simulated fire service conditions appears to be in order, and a complete report by some well-recognized laboratory would be advisable.—*National Board of Fire Underwriters.*

SALVAGE AND RECOVER OLD WORN OUT ROLLS



Reconditioned industrial rolls not only offer economies to users but often advantages in changing to a different type of material for the jacket. In the photograph above is shown a roll originally covered by rubber, with the worn out surface quite evident. The bottom half of the picture shows the same roll after being rebuilt by the Rodney Hunt Machine Company, Orange, Mass. The old rubber was removed and a new covering was applied, this being a stainless steel jacket. The new roll was also supplied with a stainless steel splash flange and stainless steel hub. The company reports that many rolls having worn out metal surface of brass, stainless steel, etc. can be either resurfaced or recovered with a new metal.

SWEEPING ECONOMIES

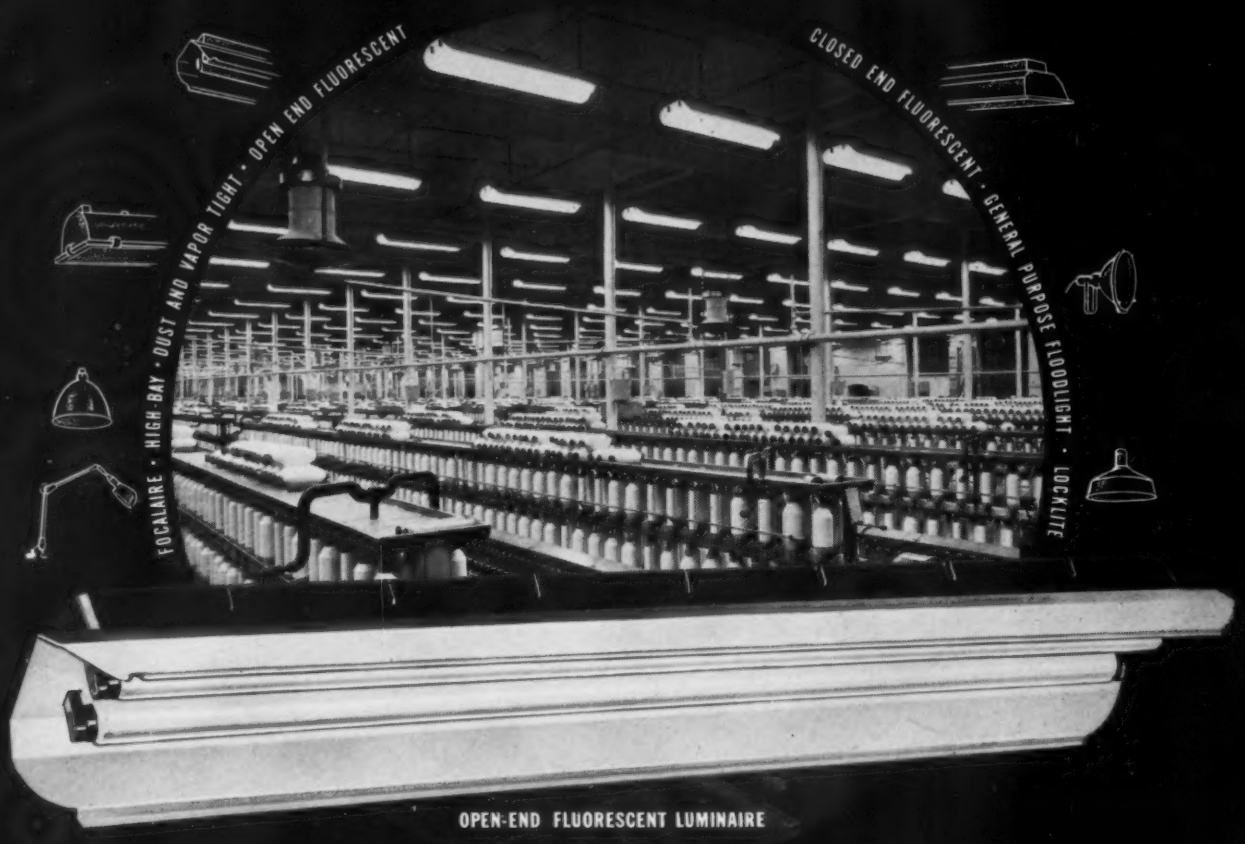
with FULLER FLOOR BRUSHES

Sweep Better
Last Longer...

- Selected filler materials including high grade bristle, stiff horse tail hair and selected fibers.
- Full, firm sweeping surface wears down evenly.
- Long trim sweeps clean — wears longer.
- Widths from 12″ to 36″.
- Solid, polished hardwood blocks — two threaded handle holes.
- For the best in industrial sweeping, make sure you get Fuller Wood-back Floor Brushes.

TELEPHONE your Local Fuller Branch Office or write

The FULLER BRUSH Co.
INDUSTRIAL DIVISION
3554 Main St. • Hartford 2, Conn.


FOCALAIRE • HIGH-BAY • DUST AND VAPOR TIGHT • OPEN END FLUORESCENT
CLOSED END FLUORESCENT • GENERAL PURPOSE FLOODLIGHT • LOCKLITE

OPEN-END FLUORESCENT LUMINAIRE

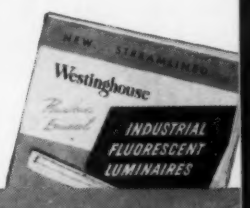
For Factories WESTINGHOUSE PLANNED LIGHTING PAYS

. . . WITH INCREASED PRODUCTION . . . LESS SPOILAGE AND REJECTS

HERE'S WHY. You get the right quality and quantity of light for every industrial task. The result: more production per worker . . . greater accuracy . . . better inspection . . . less spoilage and rejects . . . a safer plant and better labor conditions. No wonder Westinghouse *Planned Lighting* Pays.

THE RIGHT EQUIPMENT. Take a close look at the new Westinghouse Industrial Fluorescent: Built for long life . . . easy to install . . . easy to maintain . . . 9 mounting methods . . . enclosed hood protects ballast; improves appearance and rigidity . . . starters are easily, quickly accessible; readily identified . . . there is a complete line with open or closed ends; for individual or continuous strip mounting.

No matter what your lighting problem, you will find the answer in the wide range of Westinghouse fluorescent, incandescent and mercury-vapor equipment. A Lighting Sales Engineer will be glad to study your problems and help with a plan. For information call your nearest Westinghouse distributor, or send for a copy of B-3955. Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Penna. J-04155

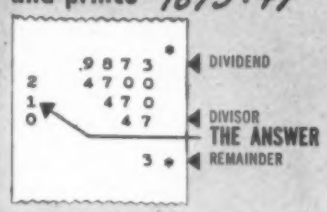


Your local power company and electrical contractor will be glad to help with your planning

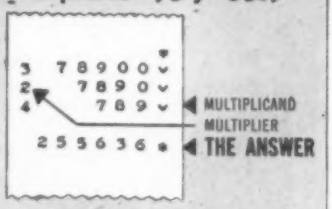
Westinghouse
PLANTS IN 25 CITIES OFFICES EVERYWHERE
Westinghouse Electric Corporation • Lighting Division • Cleveland, Ohio
COMMERCIAL • INDUSTRIAL • FLOODLIGHTING • STREET • AVIATION

Services of a Lighting Sales Engineer are available through your near-by Westinghouse distributor

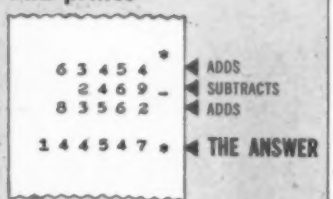
*divides automatically and prints–*9873÷47*



multiplies electrically and prints–*789×324*



adds, subtracts and prints



the PROOF is on the TAPE!

Management needs proved figure facts on which to base important decisions. Inventory reports, profit percentages, cost estimates and the multitude of figure information necessary to run a business must be computed accurately. That's why Remington Rand's Printing Calculator serves every size business by eliminating incorrect computations and misleading reports . . . by saving valuable time ordinarily lost copying figures and re-calculating problems.

Your facts are right the first time when the Printing Calculator produces your figures. This machine never relies on assumptions . . . it automatically prints on the tape each factor and answer of every calculation. You never have to repeat a problem . . . the printed tape is your first-time proof of accuracy and a permanent record to which you can refer weeks or months later. Compact and simple to operate, the 10-key Printing Calculator gives you complete, rapid figuring service. It multiplies and divides automatically, adds and subtracts—*and prints each factor.*

Ask your Remington Rand representative for a demonstration, or write for further information to Remington Rand Inc., Adding-Bookkeeping-Calculating Machines Division, Department PU-3, 315 Fourth Avenue, New York 10, New York.

Remington Rand

MACHINES FOR MANAGEMENT

PRODUCTION EXECUTIVE

Office Equipment and Supplies

Monthly FORMS FORUM

Presenting Two Different Types of Purchase Order, one of which carries Conditions of Purchase on Reverse Side; and Two Types of Receiving Report

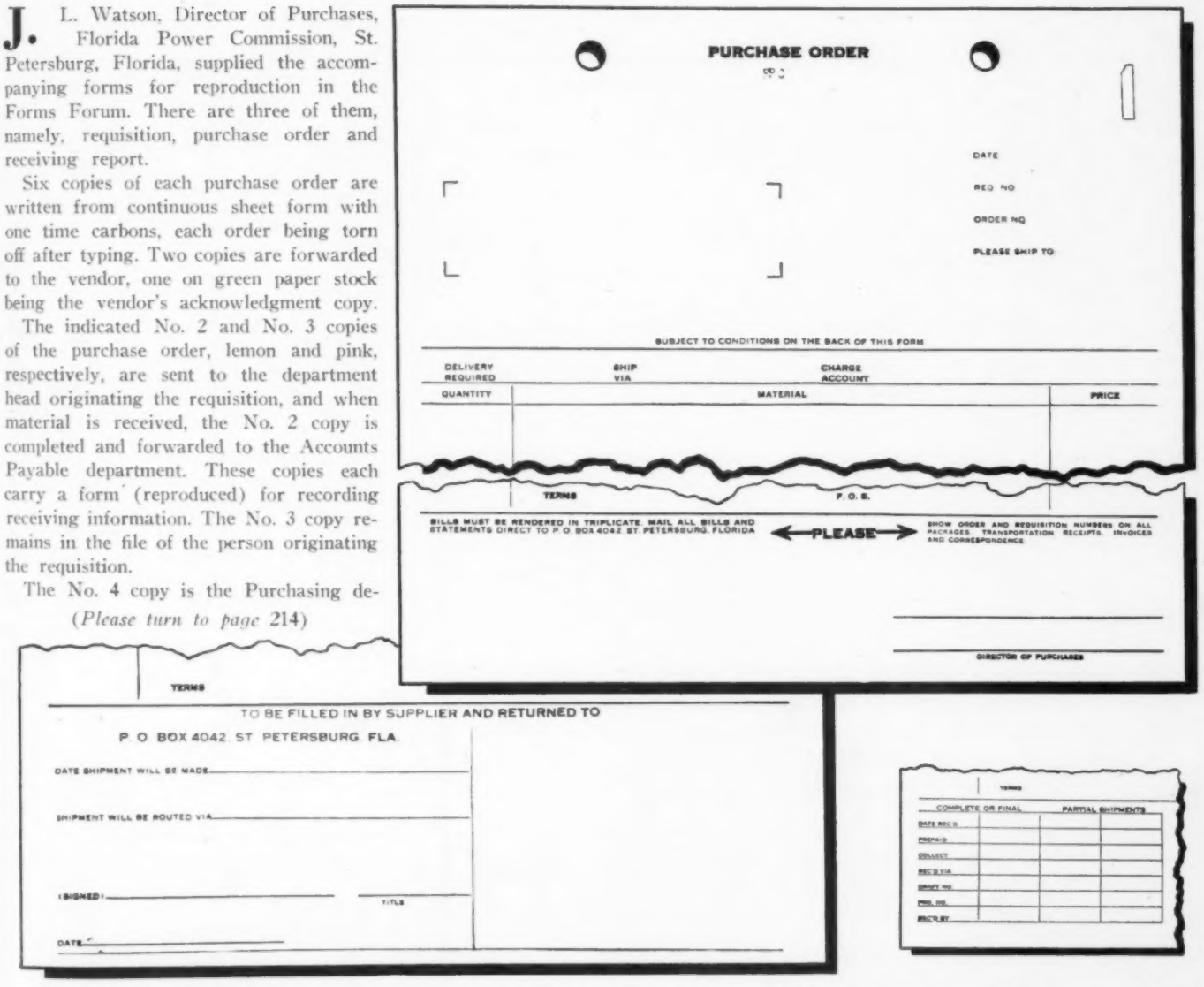
J. L. Watson, Director of Purchases, Florida Power Commission, St. Petersburg, Florida, supplied the accompanying forms for reproduction in the Forms Forum. There are three of them, namely, requisition, purchase order and receiving report.

Six copies of each purchase order are written from continuous sheet form with one time carbons, each order being torn off after typing. Two copies are forwarded to the vendor, one on green paper stock being the vendor's acknowledgment copy.

The indicated No. 2 and No. 3 copies of the purchase order, lemon and pink, respectively, are sent to the department head originating the requisition, and when material is received, the No. 2 copy is completed and forwarded to the Accounts Payable department. These copies each carry a form (reproduced) for recording receiving information. The No. 3 copy remains in the file of the person originating the requisition.

The No. 4 copy is the Purchasing de-

(*Please turn to page* 214)



PURCHASE ORDER

DATE

REQ. NO

ORDER NO

PLEASE SHIP TO

SUBJECT TO CONDITIONS ON THE BACK OF THIS FORM

DELIVERY REQUIRED | SHIP VIA | CHARGE ACCOUNT

QUANTITY | MATERIAL | PRICE

TERMS | F. O. B.

BILLS MUST BE RENDERED IN TRIPLICATE. MAIL ALL BILLS AND STATEMENTS DIRECT TO P. O. BOX 4042 ST. PETERSBURG, FLORIDA ← PLEASE → SHOW ORDER AND REQUISITION NUMBERS ON ALL PACKAGES, TRANSPORTATION RECEIPTS, INVOICES AND CORRESPONDENCE.

DIRECTOR OF PURCHASES

TERMS

TO BE FILLED IN BY SUPPLIER AND RETURNED TO

P. O. BOX 4042 ST. PETERSBURG, FLA.

DATE SHIPMENT WILL BE MADE

SHIPMENT WILL BE ROUTED VIA

(SIGNED)

TITLE

DATE

TERMS

	COMPLETE OR FINAL		PARTIAL SHIPMENTS	
DATE REC'D				
PREPAID				
COLLECT				
REC'D VIA				
DRAFT NO.				
PKG. NO.				
REC'D BY				

Purchase Order form used by purchasing department of the Florida Power Commission. The "Conditions on the back of this form" referred to in the purchase order will be found in the accompanying text.

Two copies of the purchase order (1) are sent to the vendor, and the reproduction at the lower left, is the lower part of the vendor's acknowledgment copy. This copy is not numbered.

The small cut at the right is of form on copies Nos. 2 and 3, (sent to party originating requisition) for recording receiving information.

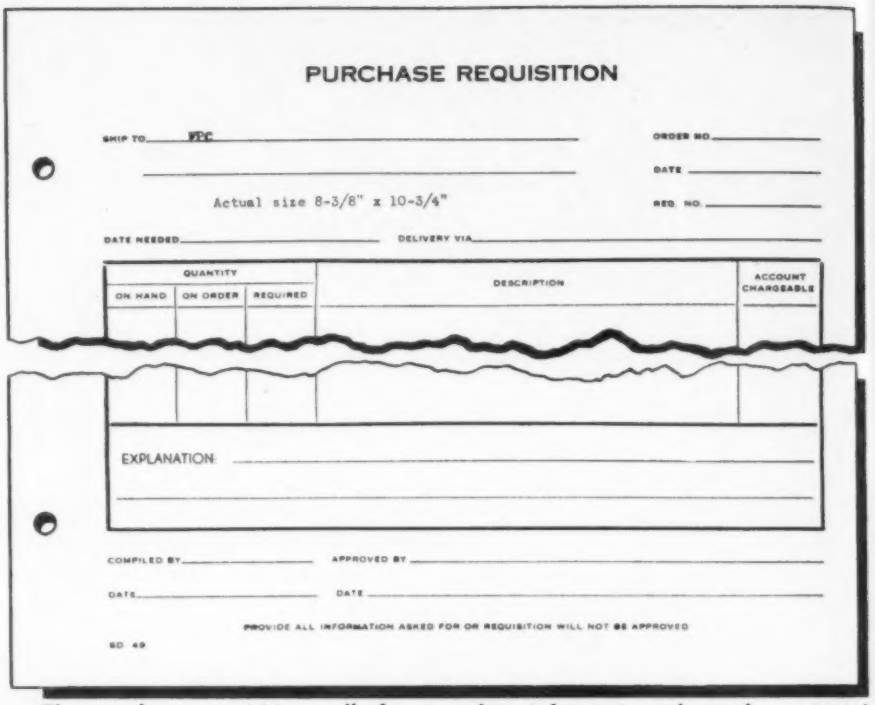
(*Continued from page* 213)

partment's numerical file copy. The No 5 copy is forwarded to the Accounts Payable department when the order is written and, following receipt of the material and payment of the invoice, this copy is marked "closed" and returned to the Purchasing department for permanent file.

It will be noted that the purchase order, though simple in form, is quite complete. It provides space for requisition number, delivery required, shipping instructions, account to which material is to be charged, terms, and other standard instructions. It also indicates that the order is "Subject to conditions on the back of this form". These conditions appear under the heading "Conditions Under Which This Order is Given and Agreed to by Selling Company". Among other things, these provide for acknowledgment and acceptance of the order; that material is subject to approval by buyer "notwithstanding prior payment to obtain cash discount"; and that payments are made by check only. The conditions in detail are as follows:

Conditions Under Which This Order Is Given and Agreed to by Selling Company

1. Acknowledge receipt and acceptance of this order, giving date of shipment.
2. The right is reserved to cancel this order if not filled within the time and in accordance with the terms specified.
3. All material subject to inspection and approval of buyer, notwithstanding prior payment to obtain cash discount. Seller must pay all transportation charges both ways on rejected material.
4. No charges allowed for boxing, packing or drayage unless otherwise agreed.
5. Payments made by check only. No drafts will be honored.
6. Each order and shipment must be invoiced separately.
7. The seller agrees to assume the defense of any suits for infringement of patents, brought against the buyer, by reason of the use of these goods and to indemnify the buyer against such suits.



PURCHASE REQUISITION

SHIP TO FEC

ORDER NO.

DATE

REQ. NO.

Actual size 8-3/8" x 10-3/4"

DATE NEEDED DELIVERY VIA

QUANTITY			DESCRIPTION	ACCOUNT CHARGEABLE
ON HAND	ON ORDER	REQUIRED		

EXPLANATION:

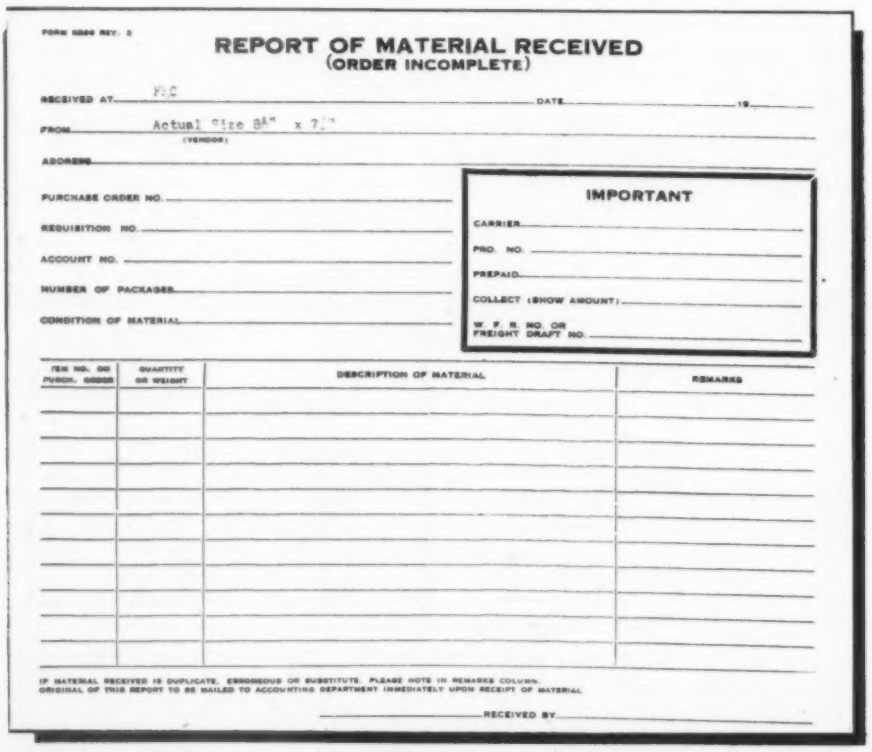
COMPILED BY APPROVED BY

DATE DATE

PROVIDE ALL INFORMATION ASKED FOR OR REQUISITION WILL NOT BE APPROVED

SO 49

The purchase requisition calls for complete information about the material requisitioned; amount on hand, on order, and required, and account to which it is to be charged. It states that all information must be provided else requisition will not be approved.



REPORT OF MATERIAL RECEIVED
(ORDER INCOMPLETE)

RECEIVED AT FEC DATE 19

FROM Actual Size 8" x 7" (VENDOR)

ADDRESS

PURCHASE ORDER NO.

REQUISITION NO.

ACCOUNT NO.

NUMBER OF PACKAGES

CONDITION OF MATERIAL

IMPORTANT

CARRIER

PRO. NO.

PREPAID

COLLECT (SHOW AMOUNT)

W. F. R. NO. OR FREIGHT DRAFT NO.

ITEM NO. OR PURCH. ORDER	QUANTITY OR WEIGHT	DESCRIPTION OF MATERIAL	REMARKS

IF MATERIAL RECEIVED IS DUPLICATE, ERRONEOUS OR SUBSTITUTE, PLEASE NOTE IN REMARKS COLUMN. ORIGINAL OF THIS REPORT TO BE MAILED TO ACCOUNTING DEPARTMENT IMMEDIATELY UPON RECEIPT OF MATERIAL

RECEIVED BY

This is issued by storerooms or office originating requisition, when only partial shipment is received, and forwarded to Accounts Payable department.

Receiving Report

The Report of Material Received, Mr. Watson states, is issued by storerooms and/or office originating the requisition for material when only a partial shipment has been received to apply on the order. This form is made out in duplicate by the party receiving the material and the original is forwarded to the Accounts Payable department and handled in exactly the same manner as the No. 2 copy of the purchase order form. The duplicate is the maker's file copy.

Shortage, Damage

If there is a shortage or over shipment, such information would automatically be shown by the receiving department on either the No. 2 copy of the purchase order, or on the Report of Material Received form. And in the event of damaged material, a notation to that effect is made on either of the above forms, and in addition the transportation bill is forwarded to the purchasing department with a complete description of the damage or loss, claim against the carrier being filed by the purchasing department.

(*Please turn to page* 216)

It's New! It's Pointed! It's Extra-Sharp!

Ask your stationer for Swingline Staples and Staplers in the red, white and blue box.

Swingline's new *SPEEDPOINT* Staples make for easier, faster stapling!

"Now we're in the groove, boss!" That Swingline Stapler loads quicker, works slicker because of its open, trouble-free channel. Handsome new model in Chrome and Grey. Made of hardened steel to last a lifetime.

The new SPEEDPOINT staples give better performance to your Swingline Stapler. SPEEDPOINT extra-sharp staples even penetrate wood, light sheet metal and 40 sheets of paper. SPEEDPOINT clinches 100-and-1 household and office stapling problems. No buckling, no jamming, because SPEEDPOINT staples are made with 100% round wire for strength, and pointed for penetration. For your Swingline Stapler, or any standard stapler, ask your stationer for the new Swingline SPEEDPOINT 100% round wire staples.

Swingline SPEED

STAPLERS STAPLES

SPEED PRODUCTS COMPANY, INC., LONG ISLAND CITY 1, N.Y.

(*Forms Forum Continued from page* 214)

Purchase Order and Receiving Report

THESE two forms, Purchase Order, and Partial Receiving Report, were sent to the Forum by Don Hinton of the Aurora Pump Company, designers and manufacturers of centrifugal and turbine pumps, Aurora, Illinois, the production of which necessitates the handling and processing of some 5,000 to 6,000 items per year including castings, electric motors, sheet steel and other materials and components.

The purchase order is of the quintuple snap-out type, with copies for vendor, purchasing department file, receiving department (which holds form until order is complete); numerical file copy and follow-up copy. The Receiving Report, bearing the instruction "All material or supplies must be reported on this Form, as soon as received", provides a rather complete record of the shipment received, including inspection, it will be noted.

Mr. Hinton states that the receiving department is under the jurisdiction of the storekeeper. This department checks material as to the number of packages and weight, but the actual count is made by one of the stock room clerks. The latter, it is felt, having no knowledge of the actual number of pieces ordered, will feel duty-bound to actually count the material and report accordingly.

Technical inspection as to size, etc. is made on all material for which tolerances have been specified, and in such cases, receiving department copy of purchase order is marked "inspection required." All other inspection is handled by the storekeeper from the information on the purchase order.

ORIGINAL PURCHASE ORDER

AURORA Always PUMPS

Tel. Aurora 2-7681

AURORA PUMP COMPANY

MANUFACTURERS OF PUMPS TO MEET ALL CONDITIONS

AURORA, ILLINOIS

PURCHASE ORDER No. 27559

REQUISITION No.

SHOW PURCHASE ORDER AND REQUISITION NUMBERS ON ALL INVOICES, PACKAGES AND CORRESPONDENCE.

To

DATE

PLEASE ENTER OUR ORDER FOR THE FOLLOWING SUBJECT TO CONDITIONS BELOW:

SHIP TO

FOR RESALE

FOR CONSUMPTION

SHIP VIA | DELIVERY REQUIRED | FOR | DEPT. | ACC'T NO.

ITEM | QUANTITY | OUR SYMBOL | SPECIFICATIONS | PRICE AND TERMS

DUPLICATE INVOICE REQUIRED

CONDITIONS

By accepting this order you agree to indemnify us against any claims and demands for infringement of patents covering the whole or any portion of the goods above described.

An acknowledgment advising delivery date is expected.

Mail invoice in duplicate with shipping documents to Aurora.

Do not execute this order at higher prices than listed without our permission. If not delivered at specified date, or if quality is not as ordered, we reserve the right to cancel. Subject to correction of typographical errors.

RECEIVING RECORD

ITEM | QUANTITY | DATE REC'D | ITEM | QUANTITY | DATE REC'D

AURORA PUMP COMPANY

PURCHASING AGENT

RECEIVING REPORT

All material or supplies must be reported on this Form, as soon as received.

DATE _____ No. _____

RECEIVED FROM APC

ADDRESS 8½" x 5½" CITY _____

V I A: Freight ☐ Truck ☐ Express ☐ P. P. ☐ | NO. OF PACKAGES | WEIGHT | PREPAID $ | COLLECT $

QUANTITY | DESCRIPTION | INSPECTOR'S REPORT

Purchase Order No. | DEL'D. TO DEPT. BY DATE | INSPECTED BY DATE

Charge to

ENTERED ON STOCK RECORD BY DATE | CHARGED DIRECT TO ORDER BY DATE | Received by

STANDARD FORM 287

TYPIST'S COPYHOLDER WITH LINE GUIDE

Holder can be used with any typewriter.

Illustration shows typist's copyholder marketed by the Copy-Right Manufacturing Co., 53 Park Place, New York, N. Y., which features a line guide. The device holds a typist's notes or other copy work (including sheets up to 36" wide, in an easy-to-see eye-level position just above the typewriter carriage. A semi-automatic metal finger points out the exact reading place one line at time, the mechanism being controlled by a ball-bearing clutch arrangement. The holder is described in Bulletin B-100.

INDIANAPOLIS HEADQUARTERS OF NEW MCBEE DIVISION

H. C. Davis, vice-president in charge of sales of the McBee Company, has announced the establishment of a new division with headquarters in Indianapolis. Robert N. Edgett, formerly district manager of Indianapolis, has been named to head the new division. It will cover all of Indiana, Kentucky and the central and southern parts of Ohio.

Mr. Edgett joined McBee's sales force in 1938. McBee maintains offices in all the principal cities of the new division. Further expansion will take place under Mr. Edgett's direction.

The company, which manufactures special accounting methods and equipment, has its main plant in Athens, Ohio, with others in Los Angeles, St. Louis, New Brunswick, N. J. and Montreal. General sales headquarters are in New York City.

(*Please turn to page* 219)

COLOR PHOTO BY RALPH RAWLINGS—UNDERWOOD

New Invention for Executives' Desks!

BEFORE you reach for your pen to sign your mail . . .

STOP! . . . this is an important moment in your business day.

LOOK! . . . at the letter. How is it spaced and typed? At the letterhead.

How well does it represent you?

LISTEN! . . . to the urge to improve your letters and your letterheads *today*—for better business tomorrow.

For better-looking letters, print your letterhead on HOWARD BOND.

In whitest white, or in any of its clear, clean colors, HOWARD BOND does complete justice to you, to your company, and to what you have to say. So stop—look—listen—then GO to HOWARD BOND for letterheads.

HOWARD PAPER MILLS, INC. • HOWARD PAPER COMPANY DIVISION, URBANA, OHIO

Howard Bond

"THE NATION'S BUSINESS PAPER"

Sequins for Secretaries?

After all, there's a place for everything

Fine bond paper has an important place of its own in business, of course. But for the unglamorous yet necessary task of keeping most business records, it's practical to use a sturdy, inexpensive bond—one that's made especially for multi-copy forms, inter-office correspondence and all other routine business printing.

In short, it's practical to use thrifty Maxwell Bond.

Maxwell works well with pen, pencil or typewriter. It prints cleanly, erases without smudge and produces clear carbons. Although it bears a distinguished watermark, Maxwell Bond is priced well within the limitations of every office budget.

Maxwell Bond

America's Favorite Low-Cost Bond

Howard Paper Mills, Inc. • **Maxwell Paper Company Division** • **Franklin, Ohio**

BUSINESS MACHINE AND TYPEWRITER LAMP

The Mitchell Model No. 1012 fluorescent lamp is designed for typewriters, adding machines, comptometers, etc., and has a reflector that swings, tilts, extends in any direction. The steel base slips under any portable office machine and cannot tip or tilt, according to the maker. There is nothing to attach to the machine.

The lamp uses one 8-watt fluorescent tube. Base and reflector are in glareless, black wrinkle business machine finish. Upright and extension rod are smooth aluminum tubing. On-off switch is built into reflector. The lamp comes with cord and plug, and is for 110-125 volt a-c current. Made by the Mitchell Manufacturing Co., 2525 Clybourn Ave., Chicago 14, Ill.

PORTABLE REGISTER

Lightweight register for heavyweight work.

The American Register Co., 564 E. First St., Boston, Mass., has developed a portable autographic register which is characterized as "the lightweight register for heavyweight work." It is made of light gauge steel, and is said to be light enough to carry through the plant, yet sturdy enough to be used as a desk or counter register. It is adaptable for from two to five copies. It holds up to 75 sets of forms, has a file compartment, uses roll carbon, and a slight pressure on starter ejects sufficient paper to grasp for speedy extraction of the balance of the form.

McBEE ESTABLISHES PACIFIC COAST DIVISION

The McBee Company, manufacturer of accounting systems and equipment, has established a Pacific Coast division with headquarters in Los Angeles, Calif. Eleven western states will be covered from the new divisional headquarters, and offices have been opened in some of the principal cities of the division. E. R. Freed, formerly Chicago manager, has been named to head the new division.

(*Please turn to page* 230)

Multiply your profits by increasing your own efficiency!

With SOUNDSCRIBER at their elbows, tens of thousands of busy executives are saving *hours* of time . . . saving money . . . multiplying profits by increasing *their own* efficiency . . . all at low-cost convenience!

Instantly available, SOUNDSCRIBER gives you a "DO-IT-NOW" solution to dictating problems . . . does it better than any other dictation method. No need to wait for a busy secretary—nor to keep her waiting while interruptions delay your dictation. Letters, memos, instructions—even telephone conversations—are handled by SOUNDSCRIBER . . . quickly, conveniently . . . turning delays and lost motion into profits . . . freeing you *and your secretary* for the essentials of other business requirements.

Discover NOW . . . why SOUNDSCRIBER *proved* performance is unique in the field of modern dictation; why SOUNDSCRIBER is the accepted method for speeding business routine in thousands of busy organizations. The coupon will bring you proof of its profit potentials in *your* business.

SoundScriber discs hold up to 30 minutes of dictation—are easily indexed, routed, filed or mailed. Radio-clear quality insures accurate transcription. Low first cost, lower operating cost.

SOUNDSCRIBER
Trade Mark
ELECTRONIC DICTATING AND RECORDING EQUIPMENT

To find out how SoundScriber applies to *your* business, phone the nearest distributor, listed under "SoundScriber" in your classified telephone directory. Or mail the coupon.

OFFICE UTILITY STAND FOR LARGER MACHINES

The "Champion" utility stand, No. 1824, designed for larger office machines, is 27" high, has two 9" drop leaves and measures a full 18" x 24" when opened. The one-half inch hard tempered Masonite top has a lithographed walnut finish that is guaranteed not to chip, crack, warp, peel or work loose. The metal has a smooth baked enamel walnut finish.

Screw heads are recessed, hinges are the continuous piano type. Casters are free, easy rolling with 1⅝" wheels. Legs are one-inch tube steel curved for greater leg room and added stability. Manufactured by Maso Steel Products, 500 32 S. Throop St., Chicago 7, Ill.

ADDRESSING-IMPRINTING MACHINE MANUALLY OPERATED

Normal operation is 10 plates per minute.

Mini-Mailer is the name of a new addressing-imprinting machine introduced by Mini-Mailer, 1109 Lee Highway, Rosslyn, Va., which prints from a metal plate through a ribbon. Operation involves three steps—inserting plate, inserting envelope and hitting the printing head sharply.

The Mini-Mailer is portable, being but 5 pounds in weight and 8¼" x 9" in size. The printing head is pressure controlled and adjustable to accommodate the individual job, i.e., for light impression, heavy impression, single copy, or many copies. It prints a four-line impression up to 18 characters per line. The rate of operation is normally 10 plates per minute. Adjusting guides adapt the machine for varied size envelopes, cards, tags, etc. The machine is durably constructed of aluminum and steel.

(*Please turn to page 222*)

*Levelcoat** PRINTING PAPERS

A PRODUCT OF Kimberly Clark RESEARCH

Distributed by

ALABAMA
Birmingham ..... Sloan Paper Company

ARIZONA
Phoenix ..... Zellerbach Paper Company

ARKANSAS
Little Rock ..... Arkansas Paper Company

CALIFORNIA
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Stockton ..... Zellerbach Paper Company

COLORADO
Denver ..... Carpenter Paper Company
Pueblo ..... Carpenter Paper Company

CONNECTICUT
Hartford ..... The Rourke-Eno Paper Co., Inc.
West Haven ..... Bulkley, Dunton & Co., Inc.

DISTRICT OF COLUMBIA
Washington ..... The Barton, Duer & Koch Paper Co.

FLORIDA
Jacksonville ..... Knight Brothers Paper Company
Miami ..... Knight Brothers Paper Company
Orlando ..... Knight Brothers Paper Company
Tallahassee ..... Knight Brothers Paper Company
Tampa ..... Knight Brothers Paper Company

GEORGIA
Atlanta ..... Sloan Paper Company

IDAHO
Boise ..... Zellerbach Paper Company

ILLINOIS
Chicago ..... Berkshire Papers, Inc.
Chicago ..... Chicago Paper Company
Chicago ..... Midland Paper Company
Springfield ..... Capital City Paper Company

INDIANA
Indianapolis ..... Crescent Paper Company

IOWA
Des Moines ..... Carpenter Paper Company
Sioux City ..... Carpenter Paper Company

KANSAS
Topeka ..... Carpenter Paper Company
Wichita ..... Western Newspaper Union

KENTUCKY
Louisville ..... The Chatfield Paper Corp.

LOUISIANA
Baton Rouge ..... Louisiana Paper Co., Ltd.
New Orleans ..... The D and W Paper Co.
Shreveport ..... Louisiana Paper Co., Ltd.

MARYLAND
Baltimore ..... Baltimore Paper Company, Inc.

MASSACHUSETTS
Boston ..... Carter, Rice & Company Corp.
Springfield ..... Bulkley, Dunton & Co.
Worcester ..... Charles A. Esty Paper Company

MICHIGAN
Detroit ..... Seaman-Patrick Paper Co.
Grand Rapids ..... Carpenter Paper Company

MINNESOTA
Duluth ..... John Boshart Paper Company
Minneapolis ..... Carpenter Paper Company
St. Paul ..... Carpenter Paper Company

MISSISSIPPI
Jackson ..... Jackson Paper Company
Meridian ..... Newell Paper Company

MISSOURI
Kansas City ..... Carpenter Paper Company
St. Louis ..... Beacon Paper Company
St. Louis ..... Shaughnessy-Kniep-Hawe Paper Co.
St. Louis ..... Tobey Fine Papers, Inc.

MONTANA
Billings ..... Carpenter Paper Company
Butte ..... Carpenter Paper Company
Great Falls ..... Carpenter Paper Company
Missoula ..... Carpenter Paper Company

NEBRASKA
Lincoln ..... Carpenter Paper Company
Omaha ..... Carpenter Paper Company

NEVADA
Reno ..... Zellerbach Paper Company

NEW JERSEY
Newark ..... J. E. Linde Paper Company

NEW MEXICO
Albuquerque ..... Carpenter Paper Company

NEW YORK
Albany ..... Hudson Valley Paper Company
Brooklyn ..... A. Price & Son, Inc.
Buffalo ..... Hubbs & Howe Company
New York ..... Baldwin Paper Comapny, Inc.
New York ..... Bulkley, Dunton & Co., Inc.
New York ..... The Canfield Paper Co.
New York ..... Forest Paper Company, Inc.
New York ..... J. E. Linde Paper Company
New York ..... A. Price & Son, Inc.
New York ..... Royal Paper Corporation
Rochester ..... Paper Service, Inc.
Syracuse ..... Paper Service, Inc.
Troy ..... Troy Paper Corporation

NORTH CAROLINA
Charlotte ..... Dillard Paper Company, Inc.
Greensboro ..... Dillard Paper Company, Inc.

NORTH DAKOTA
Fargo ..... Western Newspaper Union

OHIO
Cincinnati ..... The Chatfield Paper Corporation
Cleveland ..... The Petrequin Paper Company
Columbus ..... The Scioto Paper Company
Toledo ..... The Ohio & Michigan Paper Co.

OKLAHOMA
Oklahoma City ..... Carpenter Paper Company
Tulsa ..... Tayloe Paper Company of Oklahoma

OREGON
Eugene ..... Zellerbach Paper Company
Portland ..... Zellerbach Paper Company

PENNSYLVANIA
Philadelphia ..... Paper Merchants, Inc.
Philadelphia ..... D. L. Ward Company
Pittsburgh ..... The Chatfield & Woods Co. of Pa.

RHODE ISLAND
Providence ..... Carter, Rice & Company Corp.

SOUTH CAROLINA
Greenville ..... Dillard Paper Company, Inc.

TENNESSEE
Chattanooga ..... Bond-Saunders Paper Co.
Knoxville ..... Southern Paper Company, Inc.
Memphis ..... Tayloe Paper Company.
Nashville ..... Bond-Sanders Paper Co.

TEXAS
Austin ..... Carpenter Paper Company
Dallas ..... Carpenter Paper Company
Fort Worth ..... Carpenter Paper Company
Harlingen ..... Carpenter Paper Company
Houston ..... Carpenter Paper Company
Lubbock ..... Carpenter Paper Company
San Antonio ..... Carpenter Paper Company

UTAH
Salt Lake City ..... Zellerbach Paper Company

VIRGINIA
Richmond ..... Cauthorne Paper Company

WASHINGTON
Seattle ..... Zellerbach Paper Company
Spokane ..... Zellerbach Paper Company
Walla Walla ..... Zellerbach Paper Company
Yakima ..... Zellerbach Paper Company

WISCONSIN
Milwaukee ..... The Bauer Paper Company

EXPORT AGENTS
American Paper Exports, Inc., New York, U. S. A.
Cable Address: APEXINC—New York

If our distributors cannot supply your immediate needs, we solicit your patience. There will be ample Levelcoat Printing Papers for your requirements when our plans for increased production can be realized.

KIMBERLY-CLARK CORPORATION • NEENAH, WISCONSIN

122 East 42nd Street, NEW YORK 17
155 Sansome Street, SAN FRANCISCO 4
8 South Michigan Avenue, CHICAGO 3
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*TRADEMARK

Before choosing any printing paper

Look at Levelcoat*

Look at Levelcoat... for brightness

Yes, for the clear brilliance that makes fine printing sparkle, look at Levelcoat.* Beautiful Levelcoat printing papers have body brightness, bred in the fiber itself. And surface luster born of clays as smooth and white as swan's down!

Look at Levelcoat... for smoothness

See it – feel it! Let your eyes and your fingers tell you how much smoother Levelcoat is. Here is an unusually fine coated paper. For Levelcoat is surfaced by a precision-controlled process... to give your printing the Levelcoat lift!

Look at Levelcoat... for printability

To pressmen, Levelcoat printability means beautiful, dependable performance, run after run. To advertisers it is an assurance that the most carefully wrought effects will come faithfully through the presses – subtly, glowingly alive!

IT PAYS TO LOOK AT LEVELCOAT

Levelcoat* PRINTING PAPERS

A PRODUCT OF Kimberly Clark RESEARCH

Levelcoat printing papers are made in these grades: Trufect†, Kimfect†, Multifect† and Rotofect†.*

*TRADEMARK
†T. M. REG. U. S. PAT. OFF.

KIMBERLY-CLARK CORPORATION, NEENAH, WISCONSIN

Old Town

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For those who prefer the best

BROOKLYN 17, N. Y.

THIN PAPERS
Reduce
TYPING, MAILING
and FILING COSTS
Use
ESLEECK
THIN PAPERS

Fidelity Onion Skin
Clearcopy Onion Skin
Superior Manifold

Esleeck Manufacturing Co.
Turners Falls, Mass.

ST. REGIS APPOINTS FORESTRY TECHNICAL DIRECTOR

Announcement is made by the St. Regis Paper Company, which is consolidating its forestry activities, of the appointment of A. B. Recknagel as technical director, with headquarters in New York. Mr. Recknagel is a forester of long experience, and stated that in his opinion the future of the paper depends on the development of good forest practices. Problems including forest surveys, management plans, and protection of the forest against fire, insects and disease, all require for their solution continuing study and application. The St. Regis Paper Company owns or controls approximately 2,000,000 acres of timberland in the United States and Canada.

NEW HAND SHAVER ANNOUNCED BY EDIPHONE COMPANY

A new model Economy hand shaver, featuring quiet operation coupled with ease of operation, is announced by the Ediphone Company, Orange, N. J. The shaver, in a completely enclosed cabinet, is a dignified and modern piece of office

Ediphone's new Economy hand shaver.

equipment. It has the same precision top plate and operation (excepting motor) that is used on the Ediphone Mercury. A convenient drawer is provided to accommodate the chips as on the Master. It is recommended for use wherever a small quantity of cylinders are employed per day.

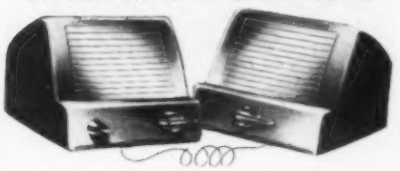
PRESIDENT McCABE OF SCOTT PAPER CO. HEADS FEDERAL RESERVE BOARD OF GOVERNORS

Thomas B. McCabe, president of the Scott Paper Co., Chester, Pa., was rececntly appointed by President Truman to be Chairman of the Board of Governors of the Federal Reserve System.

The seven-man board which Mr. McCabe will head coordinates the management of the twelve regional Federal Reserve Banks and directs the general monetary policies of the Federal Reserve System. All national banks in the country are Federal Reserve members.

Mr. McCabe has been connected with the Federal Reserve System since 1938, first as a member of the board of the Philadelphia regional bank and then as board chairman. Previously Mr. McCabe served as Deputy Lend Lease Administrator, 1941 to 1943, and later he served as special assistant to the Secretary of State and Foreign Liquidation Commissioner. For these services he was awarded the Medal for Merit.

INTER-COMMUNICATION SYSTEM WITH TWO STATIONS



"Elsie" (Model LC-2) is the name of two-station inter-communication system consists of a master unit, one sub-station and 50 feet of cable announced by Talk-A-Phone Co., Chicago 23, Ill. Additional cable, in any length from 50 to 2,000 feet, is available. Two-way conversation can be originated from the master or the sub-station.

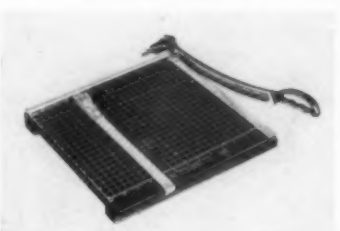
Electronic development permits optional use of the sub-station as either "private" or "non-private". When used "privately", as in a doctor's office, both the master unit and sub-station have complete privacy. Used "non-privately", the sub-station conveys sounds in one room, to another room.

Only the master station is connected to 110-115 volts, a-c- or d-c. The master unit and sub-station is Underwriters' approved.

ASSOCIATION NOTEBOOK ANNOUNCED BY A. B. DICK CO.

The A. B. Dick Company, 720 West Jackson Blvd., Chicago, announces the marketing of the "The Association Notebook," a portfolio of illustrations designed especially for use in mimeograph bulletins, newsletters, announcements and programs produced by associations, clubs and similar non-profit groups. Over 400 illustrations cover such activities as drives, campaigns and team contests to increase membership, outings, dances, entertainment, conventions, meetings and conferences.

NEW TRIMMING BOARD



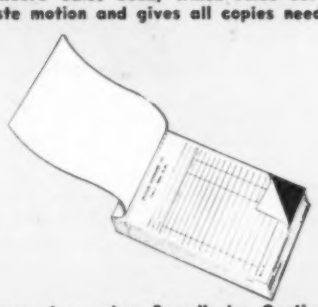
Scales in white lettering permit fast, accurate measurement.

Designed to speed up and insure accurate paper trimmings to any size desired, "Precise" trimming boards are now equipped with finger-tip control lever, according to announcement by American Photo Laboratories, 28 No. Loomis St., Chicago, Ill. The guide is easily set to the size of the cut desired by means of graduated scales, horizontal and vertical, and stays put during the entire trimming operation. Sizes range from 10½" to 24½".

(*Please turn to page* 224)

they keep things moving in the big store

Photograph taken in the great Jordan Marsh Company store, which, like hundreds of other department stores, uses Moore Business Forms by the millions. Shown below is a Moore Sales Book, which rules out all waste motion and gives all copies needed.



Moore also makes Speedisets; Continuous Forms; Fanfold Forms; Moore Registers and Flatpakit Forms; Marginal Punched Forms.

And to keep things moving *at a profit*, the department store must hold operating costs low. Here, Moore Business Forms, Inc., steps in, to help slash those costs to the bone.

Every year Moore's cost-cutting business forms save thousands of hours of office work for businesses of every kind and size. Merchant, manufacturer, jobber, wholesaler—all fight ever-rising office overhead with multi-copy forms engineered by Moore for speed.

The Jordan Marsh Company, New England's largest store, has been using Moore business forms for over 60 years. This modern, busy store eliminates wasteful copying — and guards accuracy—with a sales book that gives four copies in one writing. Belk Brothers Co., in Charlotte, N. C., along with 260 other Belk's Department Stores, control operations by using 30 different Moore forms for speed and economy.

Let a Moore specialist show you how even the smallest business can save. Call your local Moore office today.

MOORE BUSINESS FORMS, INC.

Factories in Niagara Falls, Elmira, N. Y.; Minneapolis, Minn.; Denton, Texas; Los Angeles, Emeryville, Calif. Sales Offices in over 200 cities from coast to coast, also factories and sales offices across Canada

"OFFICE HOURS" . . . . . BY LOU

Laugh at Miss W., but avoid *serious* office boners. Letting your stockroom get out of hand, for instance. Ask Your Stationer for tips on stockroom reorganization. Chances are, he can suggest a timely reminder for reordering office supplies, too. These are typical of the many services Your Stationer can render.

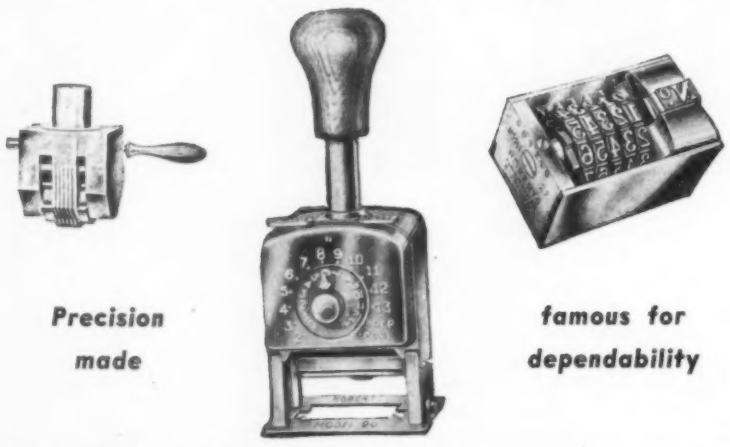
A good man to know better Your Stationer

TRADE MARKS REG. U. S. PAT. OFF.

EBERHARD FABER
LEADERSHIP IN FINE WRITING MATERIALS FOR 99 YEARS

NUMBERING IS ESSENTIAL

To Plant and Office Efficiency



Precision made

famous for dependability

From numbering production orders, stamping metal name plates, to printing business forms on a plant's printing press, make certain that a Roberts Numbering Machine is used for the accuracy and legibility that numbering requires. Write today for prices on a machine for your particular requirements, or submit your numbering problem for quick solution.

ROBERTS NUMBERING MACHINE COMPANY

702 Jamaica Avenue, Brooklyn 8, N. Y.

CORDLEY & HAYES INTRODUCE NEW COOLER MODELS

Several new models have been added to the electric drinking water cooler line of Cordley & Hayes, 443 Fourth Avenue, New York, N. Y., for 1948. Outstanding addition is the HCS-10, a completely hermetically sealed unit for office and factory, which carries a 5-year warranty plan, as all Cordley hermetic coolers do. The line now includes the following, in addition

Cordley Model HCS-10

to the HCS-10: HCS-10W, similar to HCS-10 but with a water-cooled consenser; RHCS-10, restaurant cooler; HBCS-3, hermetically sealed bottle type water cooler; CS-10, office or factory cooler with open-type condensing unit; RCS-10, restaurant type cooler for odd-cycle voltages; BCS-3, bottle-type electric water cooler.

ELECTRONIC EXECUTIVE DESK

The accompanying illustration shows the Sterling Electronic executive desk developed by the Sterling Manufacturing Co., St. Louis, Mo. The desk is designed and engineered to save time, and to provide 12 feet of desk-top space any point of which can be comfortably reached from the chair. The semi-circular design provides room for several people, and makes possible the use of the desk as a conference desk.

The Sterling Company's Electronic executive desk.

Control panels within easy reach provide for air conditioning, lighting, intercommunication, conference and telephone recording system, dictating machine, and even an electric razor outlet and ash tray. The desk also includes a fireproof concealed safe, and a compact refrigerating unit.

(*Please turn to page 226*)

FIGURE ON UNDERWOOD SUNDSTRAND...

for Simplicity...

...In Addition

YOU GET THE WORLD'S FASTEST KEYBOARD

YES, for fast, accurate *addition*, nothing can beat an Underwood Sundstrand Adding-Figuring Machine.

Notice the keyboard. You don't see a confusing maze of buttons. Just 10 numeral keys . . . arranged in natural sequence under the finger tips of one hand.

Even beginners develop a "touch" method after a few minutes' practice. Fingers "learn" this keyboard so that eyes can be kept on work sheets. No tiring head swinging back and forth from work sheets to keyboard.

Accuracy is a *natural* result

Operation is smooth and continuous. Fingers ripple naturally over the keys setting up numerals . . . quickly producing totals, subtotals and credit balances.

Underwood Sundstrand's cushioned key action eliminates finger strain. The compact keyboard means minimum hand travel. Operators are relaxed . . . more alert . . . and as a result, more accurate.

You'll find Underwood Sundstrand Adding-Figuring Machines in models for every need . . . for adding, subtracting, multiplying, and dividing. Capacities from 6 to 13 columns.

Call your nearest Underwood Corporation office for a demonstration *today*.

Underwood Corporation

Adding Machines . . . Accounting Machines . . . Typewriters . . .
Carbon Paper . . . Ribbons and other Supplies

One Park Avenue — New York 16, N. Y.

Underwood Limited, 135 Victoria Street, Toronto 1, Canada

Sales and Service Everywhere

Underwood . . . *Speeds the World's Business*

ROTO-SHEAR
Mail Opener

Opens Mail
FASTER, BETTER

Business firms from coast to coast are using ROTO-SHEAR Mail Openers to speed up handling of incoming mail, and increase office efficiency. Note these ROTO-SHEAR features:

1. Saves time — 40 to 60 letters per minute.
2. Opens envelopes up to 11".
3. Less fatigue to operator.
4. Less damage to mail.
5. A precision instrument made of finest materials.
6. Self-sharpening blade.
7. Safety feature prevents cutting fingers.
8. No paper lint to get on clothes.

Order a ROTO-SHEAR today and give it a trial. Once you try it you'll wonder how you got along without it **$34.95**
F.O.B. Dallas

ROTO - SHEAR CO., Ltd.
4503 TRAVIS STREET DALLAS, TEXAS

ELECTRIC LETTER OPENER

USPM Letter opener is electrically operated

Illustration shows USPM letter opener, being marketed by Commercial Controls, Corporation, Rochester 2, N. Y. The machine has but three moving parts. The body is of one piece aluminum alloy casting. The machine is electrically operated and is capable of opening mail of varying thicknesses as fast as an operator can feed it into the machine. The machine weighs 28 pounds.

VISIRECORD BUYS TRI-POSTER

The Tri-Poster, a multiple posting machine, will shortly be added to the line of Visirecord visible business systems, through the recent purchase of all rights, title and interest from the Cummins Business Machines of Chicago, by The Visible Corp. of New York.

Tri-Poster is the mechanical means of hand-posting three or more records simultaneously whether the posting be random or coordinated or the records of equal or different sizes.

DICK ANNOUNCES TWO NEW STENCIL SHEETS

Two new stencil sheets designed to speed up and simplify the composition and reproduction of stencil duplicated 4-page folders, bulletins, reports, programs and newspapers, are announced by the A. B. Dick Company, 720 West Jackson Boulevard, Chicago, Ill. These consist of the regular all-purpose Mimeotype 960 (legal size blue) stencil sheets with special guide lines for planning and typing stencils for 4-page folders and two or three column layouts.

The 4-page folder stencil sheet it is claimed will save considerable time in the preparation of booklets, invitations, programs, announcements and other folders.

GUMMED LABELS AND STICKERS CATALOG

Hundreds of gummed labels and advertising stickers are illustrated in brilliant full color in 80-page catalog, demonstrating the results of the FentOnamel process, issued by the Fenton Label Co., 506 Race St., Philadelphia 6, Pa. The letters are clear, sharp and clean cut, the rich deep blues, red, and bronze green colors, and gold and platinum tints, making outstanding labels. Samples available on request.

Weldon Roberts Erasers

They Correct Mistakes in Any Language

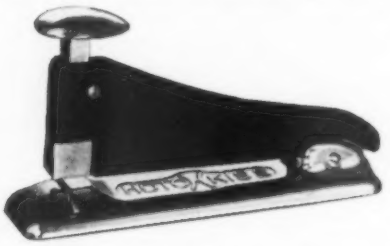
IN DRAFTING ROOM . . . OFFICE . . . SCHOOL

No. 399 TRI-PLY — for typists
CENTER PLY — soft gray ink and type eraser
OUTER PLIES — red rubber, for all general erasing

No. 235 CORAL — Versatile coral pink soft ink eraser; bias beveled for erasing details; broad flat surfaces for cleaning.

WORLD'S QUALITY STANDARD

WELDON ROBERTS RUBBER COMPANY
Newark 7, New Jersey



For Improved Office Efficiency

A *Hotchkiss* MODEL 5L STAPLER
ON EVERY DESK

There's less fatigue and better fastening with this modern stapler. Just press, don't pound the knob to fasten papers with a permanent or temporary clinch. A rubber base pad prevents scratching desks or slipping. Hotchkiss Model 5L is the world's easiest loading stapler. Just three instant steps and it is loaded, ready to make 210 more quick easy clinches.

Ask your stationer or write direct for complete information about this and many other staplers and tackers.

For best results, always use Genuine Hotchkiss Staples in your Stapling machines.

THE E.H. *Hotchkiss* COMPANY
NORWALK • CONNECTICUT
"Pioneers in all that's best in stapling"

WOMAN'S WORK WAS NEVER DONE

"A man works from Sun to Sun.
But a woman's work Was never done"
Until Ferriff's Perfect Washer
came to her ken, And now She's through before the men.
Bolgiano's Little Giant Water Motor
will run your Sewing Machine, Dental Lathe or Fan, and do 10 times the work. Price, $5.00
Motor, with Fan Attached $8.00
Motor Electric Fans $5.00
Bolgiano's Perfection Gas Iron
will iron your clothes without a stove.
Price, $5.00
Bolgiano's Steam Clothes Washer
does all the washing without any work. Clothes wear twice as long.
Price, 60 Cents, Postpaid
Illustrated Circulars sent free upon request.
The Bolgiano Water Motor Co., Baltimore Md.
DAY'S INSTANTANEOUS HEATER
—AND—
Bath Tub Combined.
The only Portable Folding Bath Tub made. Can be stored in space 2½x 2½x6 feet. Can be moved from bathroom to sickroom. Write for catalogue and discounts. Made by
THE DAY MFG. CO.
Detroit, Mich., U. S. A.

The Bettmann Archive

What a stir the combined instant hot water heater and folding bath tub made 50 years ago! And my, how Grandma longed for the "Little Giant" water motor, and the "Perfection" gas iron! Makes you wonder how woman's work was *ever* done in '98.

Only half a century, yet what spectacular changes in our way of life! The "perfect" washer has gone electric. The bath tub and shower have become miracles of efficiency. In labor-saving devices and in the even more vital fields of education and public health—our progress has amazed the world.

What made all this possible? Many things, all typically American. Chief among them is the dynamic act of pressing movable type against paper, and getting the result before as many people as possible. Without this, education would still be in the slate-and-horn book stage. Promotion would still be in the hands of the door-to-door peddler. Our modern distribution of ideas and information would still be unknown.

So here's to the editors and educators, the authors and ad men, the printers and publicists who have made paper do so much in so little time. And the end is not in sight. We look to the next 50 years with all confidence that the best is yet to come!

INTERNATIONAL PAPERS

For Printing and Converting

FIFTY YEARS OF PAPER MAKING

USE FORMS THAT CAN
"take it!"

—forms that stay clear and legible—that won't crack up under continued use. Ask your printer about this first requisite for business forms. He's an expert. And he'll tell you why "Rising is right for the job"!

Rising Bond

✓ 25% rag ✓ white and 5 colors
✓ envelopes in 6 sizes ✓ 4 weights
✓ excellent printing surface for engraving, lithography, gravure or letterpress

WHEN YOU WANT TO KNOW . . . GO TO AN EXPERT!

Rising Papers

Rising Papers

ASK YOUR PRINTER . . . HE KNOWS PAPER!

Rising Paper Company, Housatonic, Mass.

Combined Operations

with

MULTI-COPY BUSINESS FORMS — PRECISION BV PRECISION

SAVES TIME... SAVES MONEY

On the job, in many different businesses, Bonnar-Vawter engineers have given proof of greater efficiency after installation of Bonnar-Vawter especially devised, Multi-Copy Precision forms and systems. Thousands of firms all over the nation use the "Bonnar-Vawter way" to keep costs lower.

Get Your Own BONNAR-VAWTER System

There is no charge . . . no obligation to learn how Bonnar-Vawter Precision systems and forms will help your record-writing operations. A Bonnar-Vawter system engineer will simplify and improve your record-writing.

Consultation FREE...Write Today

CLIP THIS COUPON...MAIL IT NOW

Bonnar-Vawter, Inc.,
1717 East 30th St., Cleveland 14, Ohio

Supply us further information on your record-writing helps. We understand there is no obligation.

NAME..... TITLE

FIRM.....

ADDRESS.....

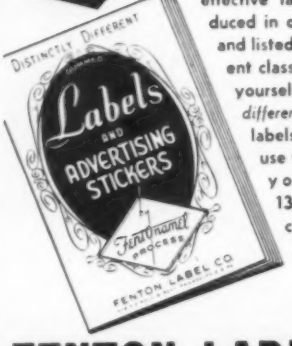
CITY..... ZONE.... STATE.....

Bonnar-Vawter business forms are continuous or cut in single sets, with or without one-time carbon, for use in all business writing machines.

600 IDEAS for LABELS & STICKERS

New Catalog FREE BY Fent Onamel

TRADE MARK REG. U. S. PAT. OFF.



Eighty pages of eye-catching, effective label ideas reproduced in one to four colors and listed under 128 different classifications. See for yourself these *distinctly different* FENT-ONAMEL labels, and how you can use them profitably in your business. 130,000 satisfied customers can't be wrong.

WRITE TODAY

FENTON LABEL CO.

DEPT. F. 506 RACE ST., PHILA. 6, PA.

DISTRICT SALES MANAGERS ANNOUNCED BY I.B.M.

International Business Machines Corporation, New York, recently announced the appointment of three new IBM district sales managers, as follows: McLain B. Smith, new District 10 with headquarters in New York; Edward C. Strandine, new District 1 with headquarters in Albany, N. Y.; and Thomas A. Kirkland, District 3 with headquarters in Atlanta.

McLain B. Smith, New York

Mr. Smith joined the company in 1933 after his graduation from Fordham University and served at New York, Rochester, Hartford, Washington and Chicago until 1942, when he entered the U. S. Army as a private. He was discharged in 1946 with the rank of major and after his return to the company served in New York and Philadelphia before his previous promotion, in 1947, to IBM Sales Manager of District 1.

E. C. Strandine, Albany

Mr. Strandine joined IBM in 1930 after his graduation from the University of Minnesota and served in various capacities at Minneapolis, Cleveland, Houston, New York and Washington before his previous promotion, in 1946, to IBM manager in Tulsa.

T. A. Kirkland, Atlanta

Mr. Kirkland joined the company in 1929 after his graduation from The Citadel and served in various capacities at New York, Buffalo, Baltimore, New Orleans, Chicago, St. Louis, Memphis, Kansas City, New York and Atlanta until 1943, when he was commissioned in the U. S. Navy. He was discharged in 1946 with the rank

of lieutenant and resumed his position as electric accounting machine manager at Atlanta, from which he has just been promoted.

WM. B. TYLER MADE A DIRECTOR OF MARCHANT COMPANY

Directors of Marchant Calculating Machine Co., Oakland, Calif., announce the appointment of William B. Tyler, vice president of California and Hawaiian Sugar Refining Corp., Ltd., as a director, and the election of Wallace W. Knox, a director, to the office of vice president. Mr. Knox was also named general counsel.

MAIL OPENER HANDLES 30 TO 40 LETTERS PER MINUTE

An operator can open 30 to 40 letters per minute with the Roto-Shear mail opener, according to the maker, Roto-Shear Co. Ltd., 4503 Travis Street, Dallas, Tex. Any size envelope up to and including 11" can be opened on the machine.

Roto-Shear opens letters up to 11" long.

The envelope is inserted in slot under the roller, and is opened when the lever is pulled.

The cutter bar is protected by a guard and roller, eliminating chance of operator cutting hand or finger, or getting paper lint on clothes. The Roto-Shear has Oilite bushings on roto shaft and self-sharpening cutting bar.

AUTOMATIC SPIRAL BOOKBINDING MACHINE ON MARKET

The SB6 Spiral Bookbinding machine said to be the first completely automatic binder in the mechanical binding field is announced by the Equipment Division of the Spiral Binding Co., Inc., 406 West 31st St., New York, N. Y. The machine is said to make for a highspeed flow of 800 to 1000 books per hour with the use of only one operator. It coils the wire, inserts, trims and turns the ends in one binding cycle. The machine operates with electrical-electronic controls and either push-button or pedal operation is available. Average set-up time is said to be approximately 20 minutes. The machine handles book lengths from 3 inches to 12½ inches, and uses spiral type zinc coated metal wire. It weighs 800 pounds and occupies space 16" x 36".

(*Please turn to page* 230)

STOP
that paper waste!

There's no need to waste good paper by trying to space letters neatly the "trial and error" way! Just supply your secretaries with Webster's Micrometric — the carbon paper with the numbered scale. It will show them proper spacing at a glance. They'll type even, neat pages on the *first try*.

Yet Micrometric costs no more than any other quality carbon paper.

There's no need to wait for delivery of Micrometric — or any other Webster product. There are Webster factory warehouses in key cities from coast to coast, and over 1500 Webster dealers to serve you. That's a good thing to remember the next time you want carbon papers and typewriter ribbons; duplicating carbon papers and accessories, carbon paper ribbons for photo-offset work; ribbons and carbons for Elliott-Fisher, Addressing, Adding and International Business Machines. Ask your dealer or write to F. S. Webster Company, 7 Amherst Street, Cambridge 42, Massachusetts.

Better Buy . . .

WEBSTER'S

Micrometric Carbon Papers and Typewriter Ribbons

Warehouses in: **New York, Philadelphia, Pittsburgh, Detroit, Chicago, San Francisco, Cambridge**

MULTIKOPY Reg. U.S. Pat. Off. MICROMETRIC MULTIKOPY AN 86 NOISELESS

Where to get

NEW ITEMS— NEW SOURCES OF SUPPLY... quick

A specialized buying directory designed and built for production, purchasing and engineering executives—to assist them, in the easiest manner, to secure sources of supply for all equipment, products or supplies used by industry.

Compact, complete and yet easy to handle—that's PLANT PURCHASING DIRECTORY.

Five separate sections make up this directory—A CLASSIFIED SECTION, containing the names and addresses of manufacturers classified by product—A TRADE NAME SECTION, listing alphabetically the trade name of the product with name and address of the manufacturer—An ADDRESS SECTION, giving the names and addresses of American manufacturers—A CHEMICAL SECTION, listing by product the name and address of important manufacturers—A MECHANICAL DATA SECTION, giving 34 pages of helpful tables, formulas, etc.

Use PLANT PURCHASING DIRECTORY! You'll really like it.

If by chance you haven't a copy, write us. We want every industrial buyer to have the benefits of this handy purchasing reference.

Incidentally, mentioning PLANT PURCHASING DIRECTORY, when sending out inquiries, means much in helping to increase our service to you.

Reach for ➡ *Keep it Handy*

PLANT PURCHASING DIRECTORY

333 N. Michigan Ave., Chicago 1, Ill.

A Conover-Mast Publication

ROYAL ANNOUNCES NEW MANAGER AT HARRISBURG

T. R. Stansbury, former Philadelphia Salesman, has been named manager at Harrisburg, Pa., according to announcement by Office Typewriter Sales Manager

T. R. Stansbury, Royal manager at Harrisburg

D. B. Starrett, Royal Typewriter Co. Mr. Stansbury started with Royal as a junior salesman in Baltimore in 1931, and was made salesman at Philadelphia in 1936.

POST OFFICE DEPARTMENT INSTALLS STAMP VENDING MACHINE

The first automatic stamp vending machine to dispense postage stamps at face value was recently placed in operation by the U. S. Post Office Department in the lobby of the Rochester, N. Y. office. Operated by the insertion of a coin, the machine issues five 1¢ stamps for a nickel, two 5¢ airmail stamps for a dime, and five 3¢ stamps for a nickel and a dime. It is equipped with a detector mechanism which rejects spurious coins and is rendered inoperative when the supply is exhausted.

Mayor Samuel B. Dicker of Rochester, N. Y., buys first stamp from first automatic stamp vending machine installed by Post Office Department.

The machine will enable the public to procure stamps from machines in the lobbies of post offices after business hours as well as on Sundays and holidays. The post office department has ordered 1,500 of the vending machines for installation in the larger first-class post offices throughout the country. The machines are being made by the Commercial Controls Corp., Rochester 2, N. Y.

MACHINE PASTE BULLETIN

Paisley Products, Inc., 1770 Canalport Ave., Chicago, Ill., announces a new Technical Service Bulletin No. 20 describing improved folding machine for paste binding of small pamphlets, magazines and similar publications.

It is claimed that the use of these paste eliminates saddle stitching and separate trimming operations, as pamphlets of 8, 12 or 16 pages can be folded, pasted and trimmed in one operation and packed for shipment direct from the discharge end of the machine.

"REST-A-PHONE" PERMITS FREEHANDED TELEPHONING

Device frees both hands of telephone user.

Designed for comfortable, free-handed telephoning is the "Rest-A-Phone", molded of lustrous, lightweight Tenite plastic. The curved shoulder piece is padded on the underside, and may be flexed for the best fit. The earphone is held in the bracket by a metal strip which snaps over retainers on the bracket ends. The device is manufactured by Rest-A-Phone Co., P. O. Box 8788, Portland 7, Ore.

ROYAL MAKES NUMEROUS PERSONNEL CHANGES

Royal Typewriter Co., New York, N. Y., has recently announced numerous personnel changes.

S. R. Langes, former South Bend, Ind. manager, has been promoted to district manager at Detroit, Mich. Former St. Louis salesman A. E. Staehle has been named to fill the South Bend managership. C. A. Bue, former Minneapolis, Minn. salesman, has been appointed to head the St. Paul, Minn. office. P. M. Hagan, former Akron, O., salesman, and William Cone, former Boston, Mass. salesman, will head the Scranton, Pa. and Springfield, Mass. offices respectively.

Robert H. O'Neil has been named to cover the upper New York and Vermont areas as a district portable representative. Special Roytype representative John T. Dessereau has been appointed assistant Roytype sales manager, in the business machine supplies division.

NEW HANGER STAND FOR MOTO-ERASER

The Dremel Manufacturing Co., Racine, Wis., has developed a new hanger stand for the Dremel Moto-Eraser. The base, finished in crackle-enamel, contains a well for storing eraser tips. New features of the Moto-Eraser include an eyelet for hanging the machine out of the way, either on the stand or any other convenient place. A flashlight type switch, located on the front of the machine, starts and stops the motor, or keeps the eraser in continuous operation as desired.

LAMAR HARDY ELECTED DIRECTOR OF I. B. M.

Hon. Lamar Hardy, former U. S. Attorney for the Southern District of New York and former corporation counsel for the City of New York, has been elected a director of International Business Machines Corporation, New York, succeeding

John L. Stainton, resigned. Mr. Hardy, who is a member of the law firm of Davies, Auerbach, Cornell & Hardy, is a graduate of Mississippi and of Vanderbilt University Law School and is a member of the American and New York State Bar Associations. He also holds an honorary degree of LL.D. from the University of Mississippi.

HERBERT A. POST INC. EXPANDS PACKAGING LINE

Herbert A. Post, Inc., New York, N. Y., has added a complete stapling line to its shipping room supplies by taking over the entire organization of the Star Paper Fastener Co. of New York. The company will now handle the sales, distribution and servicing of Star & Hotchkiss staple machines and staples for both office and industrial use in the New York area.

(*Please turn to page* 231)

how to cut filing time with Pendaflex*

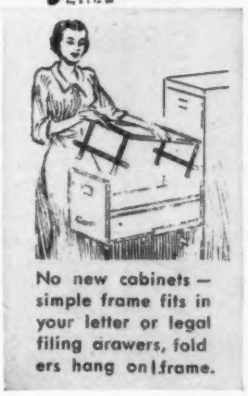
try the Pendaflex way... it takes minutes!

Replacing the conventional folders in your filing cabinets with Oxford Pendaflex hanging folders is like bolting a new engine in the ol' buggy. You replace *hours* of filing time with *minutes!*

- **FUMBLE-FREE!** The one folder you want can't play hide and seek!
- **HIGH-SPEED!** Sets you up for high-octane filing!
- **HIGH VISIBILITY!** You see every folder tab the moment you open the drawer!
- **LOOK-UP TIME CUT IN HALF!** Nationally known firms testify Pendaflex cuts look-up time in half!
- **NO MISFILING!** The world's fastest and easiest filing method virtually eliminates misfiling!
- **CUTS FILING COSTS!** Pendaflex knocks down filing department costs 20%!

*Reg. U. S. Pat. Off.

Oxford Pendaflex hanging folders



No new cabinets — simple frame fits in your letter or legal filing drawers, folders hang on frame.

MONEY BACK DEMONSTRATION IN YOUR OWN FILES! *Your Pendaflex dealer will install one trial drawer of Pendaflex hanging folders on a "guaranteed to perform" basis—or money back. Call him in today, or send the coupon below for full details!*

OXFORD FILING SUPPLY COMPANY
340 Morgan Avenue, Brooklyn 6, New York

Please send your catalog on Pendaflex filing, and name of nearest dealer.

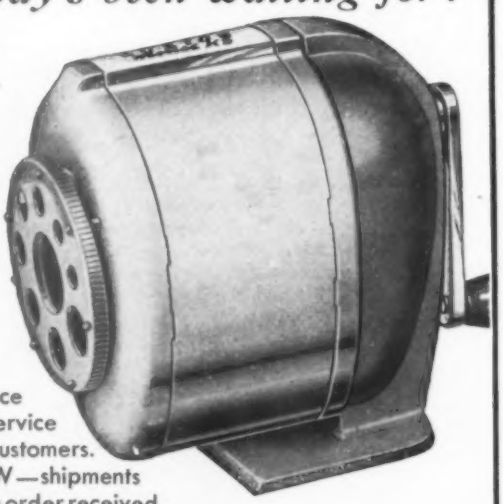
Company.....

Address.....

Individual.....

Here's that new BOSTON
everybody's been waiting for!

- *More Style*
- *More Metal*
- *More Strength*
- *Beautifully Streamlined*
- *Speed Cutters*
- *8-Pencil Size Guide*



Its appearance sells it—its service makes new customers. ORDER NOW—shipments to be made in order received.

BOSTON
PENCIL SHARPENERS

C. HOWARD HUNT PEN COMPANY
CAMDEN, N. J.

SPEEDBALL PENS HUNT PENS

MANY SMALL COMPANIES MAINTAIN OWN RESEARCH FACILITIES

Independent industrial research, usually considered an undertaking of large corporations only, plays so important a part throughout industry that about one-half of the products of smaller concerns were developed from their own research, it is revealed in reports from 983 manufacturers whose research programs were surveyed by the National Association of Manufacturers.

Results of the survey questionnaire, published over the weekend by the association as "Trends in Industrial Research and Patent Practices," show that manufacturers replying estimated their 1947 research expenditures at $207,384,188 or almost $26 million more than was spent in the preceding year.

The survey shows an increasing awareness on the part of industry of the need for research, on the part of both large and small concerns. Of the firms who replied to the questionnaire, 74 per cent said that they maintain their own research laboratories.

"Contrary to the popular belief that only large companies maintain laboratories," Howard E. Blood, chairman of NAM's Patents and Research Committee said, "the survey showed that 48 per cent of the companies having a research program, who reported gross sales of $250,000 or less, have their own laboratories, and 55 per cent of companies with sales less than $1,000,000 maintain their own facilities.

"The importance of research to small concerns, with sales under $500,000 a year, is shown by the fact that approximately one-half of them stated that all of their products were developed as a result of their own research."

Many companies reported that they planned to expand their research facilities within the next two years, though a number stated that their expansion plans have been hampered by the shortage of technical personnel and by the present high cost of construction and equipment.

While only one per cent of replies showed a research program based primarily on basic or fundamental research, and 56% described their programs as primarily for product improvement, a large proportion of the manufacturers said that they were working toward "long-term benefits" rather than immediate benefits.

The principal objective of 40% of companies replying was improvement of existing products, and an equal number reported that new product development was their prime research objective, many companies reporting that they believed that the development of new products is of greater importance to the long term-growth of the company.

O.P.A. RECORDS MUST BE KEPT UNTIL 1949

The federal agencies liquidating the Office of Price Administration have announced that the time required for the preservation by business of records relating to commodities and services de-controlled by OPA, has been extended for a period of two years to November 9, 1949.

An order issued by the Department of Agriculture, the Department of Commerce and the Reconstruction Finance Corporation, and approved by the Department of Justice, requires the preservation by all persons for an additional two year period of "all records, documents, reports, books, accounts, invoices, sales lists, sales slips, orders, vouchers, contracts, receipts, bills of lading, correspondence, memoranda and other papers, drafts and copies thereof,"—Bulletin of the National Paper Box Mfrs. Assn

TREATED CLOTH PREVENTS FOG ON WINDOWS, GOGGLES

Announcement is made by E. I. du Pont de Nemours & Co., Wilmington, Del., of the marketing of a chemically impregnated soft, absorbent cotton cloth which with one wiping keeps "fog" from forming on the inside of car windows or on eye-glasses when the wearer steps indoors. Tests with safety goggles have shown that one wiping with the cloth will keep glass clear for hours. The cloth is soaked with an anti-fogging agent and then dried. The agent is a solution of what is termed a synthetic detergent, tannic acid, glycerine, water and dye. The treated cloth may be used indefinitely.

McBEE COMPANY ESTABLISHES SAN FRANCISCO DISTRICT

As a part of the development of the new Pacific Coast Division of the McBee Co., E. R. Freed, divisional manager, Los Angeles announces the establishment of a new district in San Francisco. According to Mr. Freed, plans are under way to have representation in all the major cities of the new division which covers 11 states. Mr. Freed also announces the appointment of O. M. Larson as San Francisco manager.

The main plant of the McBee company, which manufactures special accounting methods and equipment, is in Athens, Ohio. Other plants are in Los Angeles, St. Louis, New Brunswick, N. J., and Montreal.

ELECTRICALLY DRIVEN HAND ERASER

Optional equipment includes a foot speed control.

Smooth clean erasures without smudge on tracings, drafting room copies, etc., are effected in a matter of seconds, according to the Chicago Wheel & Manufacturing Co., 1101 West Monroe St., Chicago, Ill., with the Handee electrically driven eraser illustrated. The total weight of the unit is but 12 ounces, and it is balanced and shaped to fit the hand, and handles with pencil point precision. The quick-change eraser chuck accepts any of the standard erasers. Optional equipment includes an easy to operate foot speed control which permits freedom of both hands.

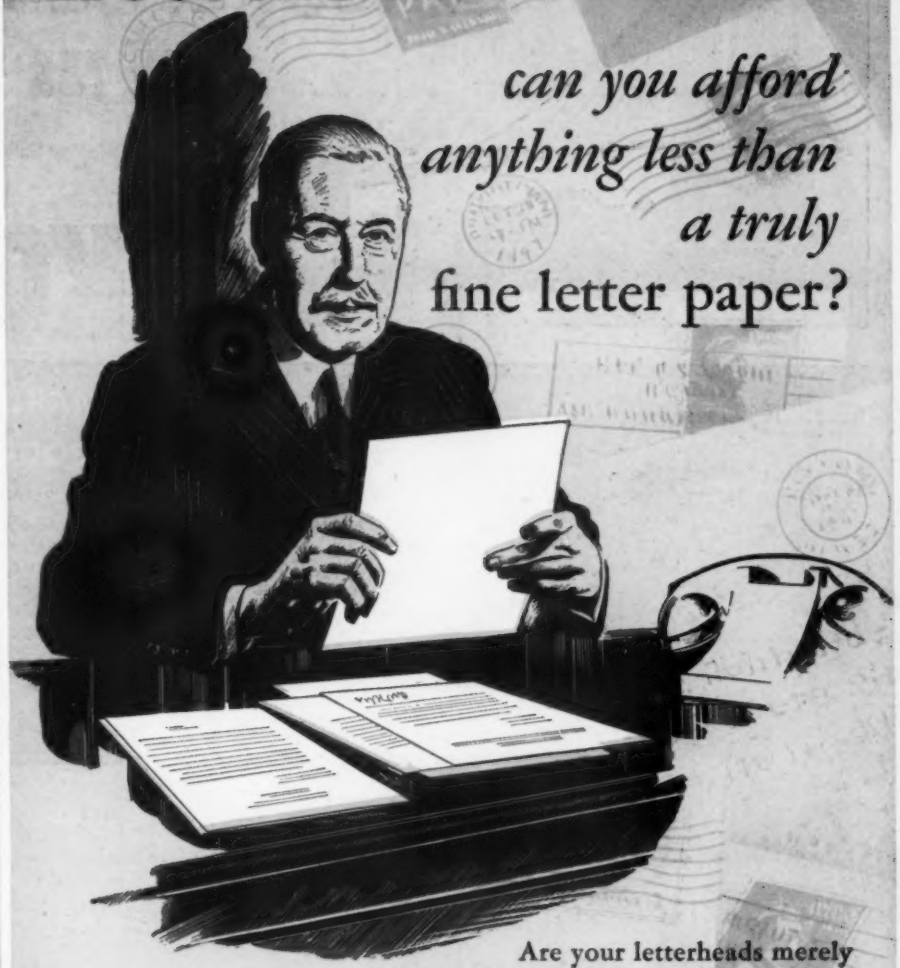
SYNTHETIC CEMENT

A fine synthetic cement, claimed to be superior to pre-war rubber is announced by the Porter Manufacturing & Supply Co., 2500 West 6th St., Los Angeles, Calif. It is known as the Porter Masking and Transfer Cement. It is described as a clear waterproof cement possessing extra adhesive strength that does not get stringy and unmanageable under normal use and storage. It cleans and rolls off with ease. Maker states that single coats of the cement are adequate for almost all normal requirements. If thinning should be required, naphtha or benzol are recommended.

SEE CLASSIFIED SECTION
PAGE 334

Letters are *so* vital

can you afford anything less than a truly fine letter paper?



Are your letterheads merely messengers . . . or are they business emissaries—conveying your words with all the dignity and impressiveness that you yourself would give them? So many important people judge *you* by your letterhead—why risk a poor public opinion? Especially when, so often, it costs no more to use WESTON paper—truly fine cotton fibre bond papers of the highest quality. Ask your supplier to run the next batch of letterheads on WESTON paper. Admire the difference. You'll insist on WESTON *quality*—always!

BONDS
WESTON'S BOND — Extra No. 1, 100% Cotton Fibre
WESTON'S DEFIANCE BOND — 100% Cotton Fibre
WESTON'S HOLMESDALE BOND — 75% Cotton Fibre
WESTON'S WINCHESTER BOND — 50% Cotton Fibre
WESTON'S BLACKSTONE BOND — 25% Cotton Fibre
WESTON'S BLACKSTONE OPAQUE — 25% Cotton Fibre
For Reports and Announcements
WESTON'S OPAQUE SCRIPT — Cotton Fibre Content
MACHINE ACCOUNTING
WESTON'S MACHINE POSTING LEDGER — 50% Cotton Fibre
WESTON'S TYPACOUNT POSTING — 25% Cotton Fibre

LEDGERS
BYRON WESTON CO. LINEN RECORD — Extra No. 1, 100% New White Cotton and Linen Fibre
WESTON'S DEFIANCE LEDGER — 100% Cotton Fibre
WESTON'S WAVERLY LEDGER — 75% Cotton Fibre
WESTON'S CENTENNIAL LEDGER — 75% Cotton Fibre
WESTON'S WINCHESTER LEDGER — 50% Cotton Fibre
WESTON'S BLACKSTONE LEDGER — 25% Cotton Fibre
INDEX BRISTOLS
WESTON'S DEFIANCE INDEX — 100% Cotton Fibre
WESTON'S WINCHESTER INDEX — 50% Cotton Fibre
WESTON'S MACHINE POSTING INDEX — 50% Cotton Fibre
WESTON'S TYPACOUNT INDEX — 25% Cotton Fibre

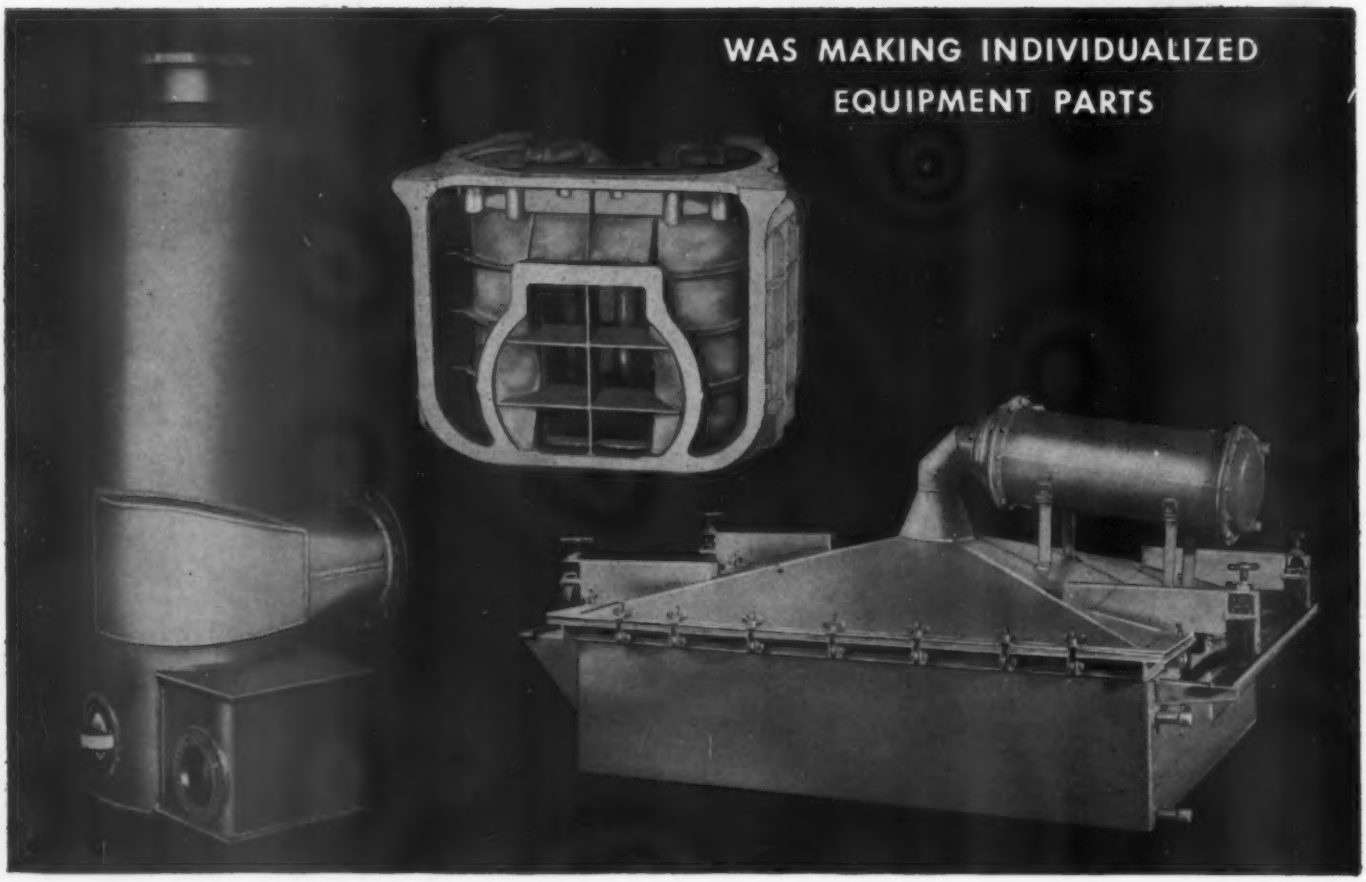
Weston
Makers of
Papers
for
Business Records

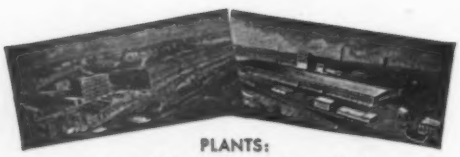
BYRON WESTON COMPANY · DALTON, MASSACHUSETTS

BACK IN THE 1880's

WHEN THE BROOKLYN BRIDGE WAS BUILT

KOVEN





PLANTS:
Jersey City, N.J. Dover, N.J.

L.O. KOVEN & BRO. INC

154 OGDEN AVE. • JERSEY CITY 7, N. J.

The busy eighties were marked by fast-paced industrial growth. And already prominent on the scene was the name KOVEN — representing engineering skill and quality workmanship in the fabrication of individualized equipment parts. Then, as today, manufacturers discovered that in most instances a part or parts of their finished products could be more economically and efficiently produced by KOVEN than such parts could be made in their own plants.

A trained representative will consult with you without obligation. Call or write KOVEN now.

Illustrated: Filter for a manufacturer of gasoline equipment; ink cooling tank for a manufacturer of printing presses; solvent recovery still.

KOVEN FOR INDIVIDUALIZED EQUIPMENT PARTS SINCE 1881

Accurate PIPE THREADS *Extra Fast*

RIDGID No. 65R offers near machine-speed in threading 1" to 2" pipe

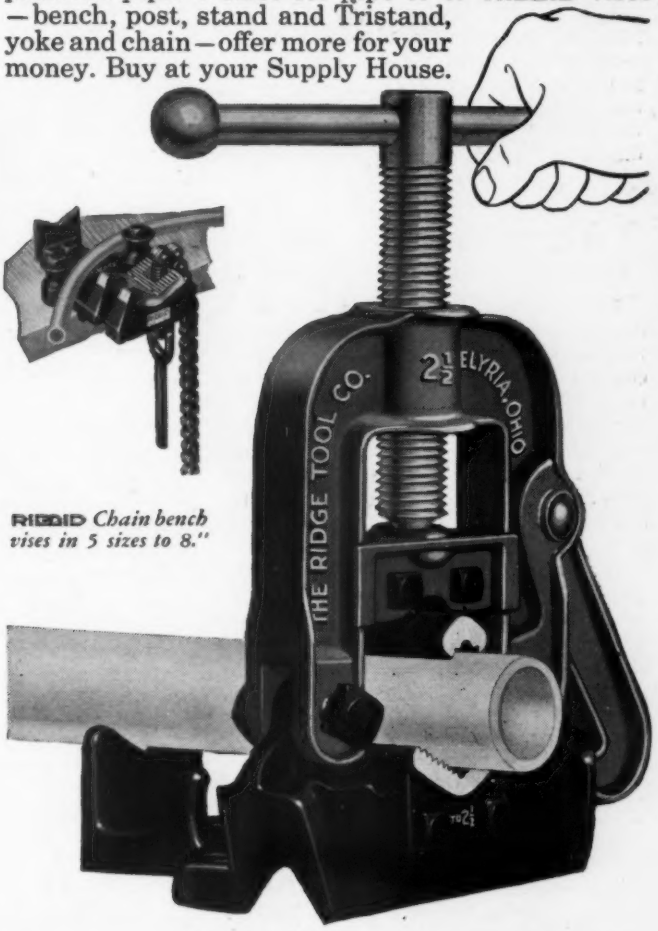
● It's unusually fast and easy for two reasons. You save on get-ready—10 seconds sets it to pipe size (1," 1¼," 1½," 2"), both chasers and workholder. And it threads any kind of pipe fast with surprisingly little effort—precision-made high-speed tool-steel dies that stay in the efficiency-balanced die stock. Factory tested—see test sample in each tool. It pays you to buy No. 65R—at your Supply House

Sulphur-Lard RIDGIL *(Ridge Oil) for better threads.*

THE *Work-Saver* BENCH PIPE VISE

RIDGID Vises are all equipped with handy pipe benders and rests . . .

● Look for red yoke RIDGIDs and you find vises that make your pipe work easier, more efficient. Integral pipe rests support pipe firmly for threading and cutting. Handy built-in benders won't flatten pipe. Tool-steel LonGrip jaws grip solidly but protect polished pipe. 8 sizes for pipe to 6." RIDGID vises—bench, post, stand and Tristand, yoke and chain—offer more for your money. Buy at your Supply House.



RIDGID *Chain bench vises in 5 sizes to 8."*

RIDGID WORK-SAVER PIPE TOOLS

THE RIDGE TOOL COMPANY • ELYRIA, OHIO

Among the ASSOCIATIONS

STEEL INCREASE THIS YEAR AUSTIN TELLS ST. LOUIS ASSOCIATION MEETING

Steel output should be increased substantially this year, David F. Austin vice-president in charge of sales of United States Steel Corp. of Delaware, told the members of the Purchasing Agents Association of St. Louis at their "Executive Night" meeting at the Sheraton-Coronado Hotel on January 27. The speech was read by B. S. Chapple, Jr., his assistant, since Mr. Austin was unable to get away from special duties in Washington to attend the meeting.

The three potentials that make the steel production picture brighter for 1948 were listed by Mr. Austin as: the government's promise to accelerate the cataloging of surplus property, which should release a sizable tonnage of scrap during the next year; efforts to improve the quality and quantity of coal of the coking type; improvements in steel mill technology. He said that U.S. Steel alone is expending more than $500,000,000 to increase production of its many steel products.

BANQUET CLOSES SUCCESSFUL CHICAGO PRODUCTS EXPOSITION

The February Products Exposition, staged by the Purchasing Agents Association of Chicago at the Hotel Sherman, closed after three successful days on February 19 with a banquet at the hotel. One hundred and fifty booths of new products and services had been shown. Clayton Rand, owner of the Dixie Press, Gulfport, Miss., was the principal speaker at the banquet, at which Oscar Iber, president of O. Iber Co. was toastmaster.

The association will hold a "ladies night" party to be known as the St. Patrick's Day dance at the Rose Room of the Congress Hotel on March 20. The affair will feature dinner, dancing and a floor show.

"ADVERTISING TO PURCHASING AGENTS"—N. E. ASSOCIATION

Featured speaker at the February meeting of the New England Purchasing Agents Association was James Thomas Chirurg, president of the James Thomas Chirurg Co., advertising agency specializing in industrial advertising. The meeting was held on February 9 at Schrafft's, Boston, Mass. In his talk, entitled "Advertising to Industrial Purchasing Agents", Mr. Chirurg outlined how an advertising agency works on purchasing agents as mediums to sell their clients' products.

The nomination of George J. Cronin, Commonwealth of Massachusetts, as the association's candidate for vice-president of the National Association of Purchasing Agents for District 9, was ratified at the meeting.

On January 21, members visited the plant of the Simplex Wire and Cable Company in Cambridge. The visit was arranged through fellow members Gibson, Bowry, Kennedy and Tyler.

TWIN CITY ASSOCIATION ELECTS NEW OFFICERS

The following officers were elected at a recent meeting of the Twin City Association of Purchasing Agents, held in the Minneapolis Athletic Club:

H. C. Powell, Minnesota Mining and Mfg. Co., St. Paul, Minn., president; G. R. Arneson, City of Minneapolis, Minn., vice-president; B. L. Nelson, Northern States Power Company, St. Paul, secretary-treasurer. Directors chosen were: N. A. Westhoff, B. F. Nelson Mfg. Company, Minneapolis; R. A. Nentwig, Superior Metal Products Company, Minneapolis; W. R. Sprague, American Hoist & Derrick Company, St. Paul; and Robert Bateman, George A. Hormel Company, Austin, Minn. H. E. Hildebrandt, Nutting Truck and Caster Company, Faribault, Minn., becomes national director.

ALABAMA ASSN. HOLDS SELLER-BUYER DINNER

Clyde H. Porter, Purchasing Agent for the Alabama By-Products Corporation was one of the principal speakers at the first annual seller-buyer dinner sponsored by the Purchasing Agents Association of Alabama, and held at the Thomas Jefferson Hotel, Birmingham, on February 19. His topic was "Recognition of Service".

Hugh P. Bigler, executive vice-president, Connors Steel Co., representing management, also spoke, on the subject "To the Purchasing Department".

ROCHESTER ASSOCIATION HOLDS EXECUTIVE NIGHT

The February 25 meeting of the Purchasing Agents Association of Rochester, held at the Sheraton Hotel, was known as "Executives Night", and featured Martin F. Hilfinger, president of Associated Industries of New York State, as speaker. His talk was based on the present industrial situation and the probable effects of state and national legislation being considered during current legislative sessions.

For the March 24 meeting, a discussion on "Streamlining Steel" will be held. The speaker will be W. A. Beck, an executive of the Bethlehem Steel Co. There will also be a showing of a motion picture on steel manufacturing processes.

The association was recently honored by having Secretary Wilson B. Wight, Purchasing Department of Bausch & Lomb Optical Co., named as chairman of the "How-to-Buy" sub-committee of the national association's Education Committee. This committee is working in close cooperation with the Rochester Institute of Technology in sponsoring an intensive training course for purchasing personnel during April.

SALES PROMOTION MANAGER SPEAKS TO ROCHESTER BUYERS

The regular meeting of the Rochester Association of Industrial Buyers was held on January 14 at the Normandie Hotel. Guest speaker was Frank W. Lovejoy, sales promotion manager of the Socony-Vacuum Oil Company, who spoke on "The Marketing Challenge of Our Times."

After discussing the factors involved in the present situation in the petroleum industry, and describing the techniques of salesmanship, Mr. Lovejoy stated that a certain amount of salesmanship was inherent in the purchasing function, since each

(*Continued on page* 238)

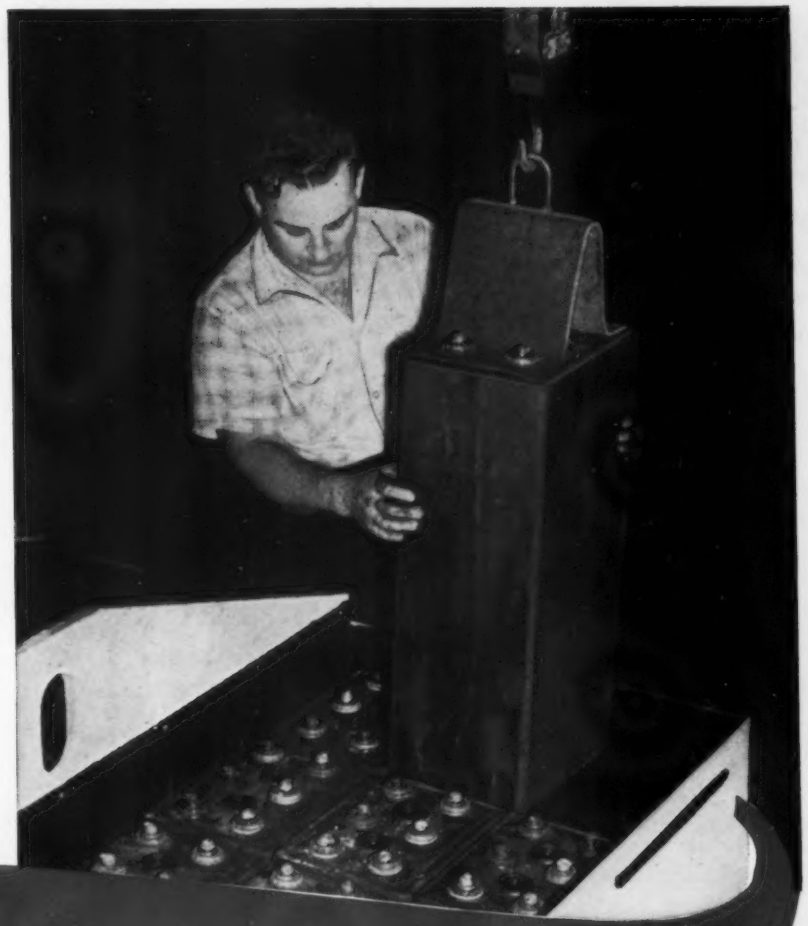
National Association of Purchasing Agents

ANNUAL CONVENTION AND INFORM-A-SHOW

Waldorf-Astoria Hotel, New York City

MAY 31 — JUNE 1 — JUNE 2

THE GREATER GOULD MEANS BETTER SERVICE



Another way you profit from the GREATER GOULD*

Nearly twenty battery manufacturing plants across the nation enable Gould to provide service and engineering facilities unequaled in the industrial storage battery field. Field Engineering Service is only one way the Greater Gould means profit to you. Increased factory facilities mean surer deliveries. Combined engineering "know how," plus the only complete battery research laboratory, mean better batteries today.

Small wonder Gould is increasingly "The Choice of Engineers."

*The Storage Battery Division of Philco Corporation was merged with the Gould Storage Battery Corporation on June 28, 1947. The consolidated organizations are operating under the name of Gould.

GOULD "Thirty" KATHANODE BATTERIES

Gould Storage Battery Corporation
TRENTON, NEW JERSEY

(*Continued from page* 236)

salesman forms his opinion of the purchasing agent's company during his interview with the buyer or purchasing agent. He said that purchasing agents should make the best possible impression by seeing that office furniture is in good shape, by keeping the office generally attractive, and by making certain that their desks are not cluttered with all the samples they have received in the last six months. An open discussion followed the talk.

ANNUAL SPORTS NIGHT MILWAUKEE ASSOCIATION

The annual sports night meeting of the Milwaukee Association of Purchasing Agents was held on February 10. The association was the guest of the Allen-Bradley Company for dinner and the evening session.

Gordon MacQuarrie, wild life editor of the "Milwaukee Journal", who recently spent considerable time in Alaska and other northerly points, spoke on his experiences and showed pictures. George Fox, line coach for the University of Wisconsin football team was another featured speaker. His talk was augmented with action pictures.

The course in purchasing at Marquette University conducted by the association began its second semester on February 9. This semester's course is a "problem" course, and covers up-to-the-minute events affecting purchasing rather than the use of textbook material.

MARSHALL PLAN DISCUSSED AT MONTREAL MEETING

"Implications of the Marshall Plan" was the subject of the principal address at the regular meeting of the Purchasing Agents Association of Montreal held in Mount Royal Hotel on January 20. The speaker was K. R. Swinton, sales manager, electronic division, R.C.A. Victor Co., Montreal, who left his native land of Austria in 1938 following the Nazi occupation. He is also honorary secretary of the Montreal branch of the United Nations Association, and a member of the Canadian Institute of International Affairs.

A discussion of the recently announced import restrictions and regulations was led by Fred Samis, who has had interviews with the authorities at Ottawa, and is a member of one of the Advisory Committees.

The February 17 meeting was the occasion for a party, at which the ladies were entertained, in keeping with an annual custom.

CLEVELAND EXECUTIVE NIGHT MEETING HEARS COL. BRADY

The annual "Executive Night" meeting of the Purchasing Agents Association of Cleveland was held at the Hotel Cleveland on February 19. Col. George Stuart Brady, economist and material consultant, and director of Industrial Material Service, Washington, D. C., was the guest speaker. The March 18 meeting, which will be "Ladies Night", will feature an appearance by Col. Jack Major, Kentucky humorist.

M. P. A. C. Celebrates 11th Anniversary

D. M. Meeker (left), president of the New York Association, congratulates A. A. Northacker, president of the M.P.A.C., on the eleventh anniversary of the group. John Splain, Commissioner of Purchases for the City of New York, looks on.

The Metropolitan Purchasers' Assistants Club celebrated its 11th anniversary at the regular meeting, held in the Midston House, New York city, on February 10. Guests of the evening included David M. Meeker, Purchasing Agent for the Paraffine Companies, Inc., New York, and president of the Purchasing Agents Association of New York, and John Splain, Commissioner of Purchases for the City of New York

Speaking on behalf of Mayor William O'Dwyer, Commissioner Splain congratulated the group on adding another year of service in a profession so vitally important to the nation's economy. Touching briefly on the current commodity price decline, he expressed a wish to look into the minds of purchasing agents to get a composite view of the "forward picture" of the general economic situation, stating that that would clarify considerably what was going on and what would result from it.

Mr. Meeker, taking as his theme, "Purchasing Trends in 1948", warned the members that nobody knows all the answers to present day problems and that their best bet was to keep alert to the situation and stay "as liquid as possible". He advised them to follow the recommendations of the business survey committee of the National Association of Purchasing Agents as closely as possible, pointing out how accurate they have been, particularly in reference to the present situation. He cautioned them to buy not more than three months ahead except in special instances.

Mr. Meeker said that he is "definitely opposed to the idea that an all-out bust is necessary" to correct any maladjustments in the economic set-up of today. He stated his belief that there is no factual basis for the fear that the country will enter a depression, and that corrections will come about "industry by industry" rather than in the form of a general smash.

EASTERN NEW YORK HOLDS PAST PRESIDENTS' NIGHT

The third annual Past Presidents' Night of the Purchasing Agents Association of Eastern New York was held at Wolferts Roost Club, Albany, N. Y., on January 15. The slogan for the meeting was: Know Your Association; Know Your Membership; Know Your Commodities.

As a novel feature, past presidents took over various offices of the association for the evening. The "Old Boys" and their posts at the meeting were: William B. Gardner, 1946-47, national director; George H. Brohm, Jr., 1931-32, president; James J. Perry, 1932-33, vice-president; Henry J. Funk, 1934-35, treasurer; Conrad P. Spuck, 1935-36, secretary; J. Leland Hodgkins, 1936-37, Charles F. Straney, 1938-39, and George L. Brown, 1939-40, executive committee; Charles F. Straney, 1938-39, chairman of the program committee; George L. Fuller, 1941-42, chairman of the membership committee; Conrad P. Spuck, 1935-36, chairman of the publicity and convention committee; and Frank M. Roos, 1924-25, chairman of the commodity committee.

"PURCHASING PROBLEMS" BRITISH COLUMBIA ASSN.

John Dunsmuir, managing director of McKenzie, White and Dunsmuir Co. Ltd. and member of the Vancouver Exhibition Association for 18 years, was the guest speaker at the regular meeting of the Purchasing Agents Association of British Columbia, held in Hotel Vancouver, Vanvouver, on January 13.

Mr. Dunsmuir, who spoke on "Purchasing Problems", stated that continued de-

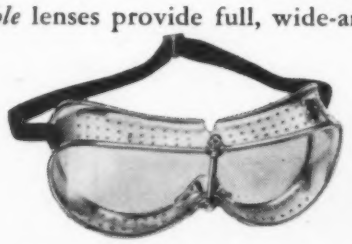
(*Please turn to page* 242)

"PANORAM"

. . . an inspired name for a wide-vision SAFETY GOGGLE

. . . and this AO Product is better than its Name!

This popular plastic goggle pleases both the worker who seeks sure protection *over* his prescription glasses and the man who needs protective goggles *only.* The *replaceable* lenses provide full, wide-angle vision and with the lightweight frames, may be had either clear or in green acetate. There's overall comfort in frames closely conforming to forehead and face . . . a bridge which fits any nose without irritation or pressure . . . eyecups vented to reduce fogging of lenses. Your nearest AO Representative can give you full information about the Panoram Goggle for combating hazards common to chipping, grinding, riveting and similar operations.



American Optical COMPANY *Safety Division*

SOUTHBRIDGE, MASSACHUSETTS • BRANCHES IN PRINCIPAL INDUSTRIAL CITIES

He saves engineering time—

D. R. PERCIVAL, *Electrical Engineer, Machine Division, Norton Company*

He cuts production corners—

BEN B. BRESLOW, *President, Utility Appliance Corp.*

"I think many designers will save time in the long run if they will decide, at the start of a job, to use standard motors." Thus speaks D. R. Percival, Electrical Engineer, Machine Division, Norton Company. "We'll eliminate the exhaustive engineering tests we used to make on fractionals. With horsepower, service factor, breakdown torque, and starting current all rated on a clear-cut, uniform basis we'll know *in advance* whether the motor will handle the job."

"The big thing about the new small-power motor standardization plan, to me, is the promise it holds of increasing the *availability* of all makes of motors," says Ben B. Breslow, President, Utility Appliance Corp. "We'll stand a better chance of getting 'off-the-shelf' delivery of motors if they are a big-production item, instead of a special. We cut a few production corners, too, by using standards. We eliminate special jigs and fixtures, and the need for making universal mounting bases and adapter plates. We can 'standardize' more of our own assembly methods."

More for your money with

STANDARD

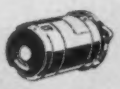
fractional-horsepower

MOTORS

FOR EXAMPLE, the General Electric machine tool motor gives you a fractional engineered specifically for rough and tumble industrial service. Totally enclosed, these motors have a rigid base and ball bearings which make them suitable for jobs where thrust is encountered. Firmly anchored windings stand up under frequent start-stop service, plugging, and momentary overloads. Descriptive bulletins on this and the 10 other main groups of standard G-E motors shown below may be obtained by writing to your nearest G-E office or *Apparatus Dept., General Electric Company, Schenectady 5, N. Y.*

Unit-Bearing Fan

Washing Machine

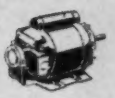

Oil Burner

Machine Tool

Gas Pump

Hermetic Refrigeration

Belted Fan


Coal Stoker

Jet Pump

Shaft-Mounted Fan

Sump Pump

General Purpose

THE NEW MOTOR INDUSTRY STANDARDS for defining motor rating and performance and the new dimension standards for small-power general-purpose and definite-purpose* motors were not set for the convenience of General Electric—or any other electrical manufacturer. They were arrived at after careful study of thousands of motor orders and months of co-operative work by industry associations and the National Electrical Manufacturers' Association. They represent the best possible co-ordination of motor design with the current needs of small-power motor users. And—these standards will be modified as design trends change, to *keep* in step with user needs. Standardization is not static!

GENERAL ELECTRIC offers you three definite advantages as a source of fractional-hp motors. First we give you the widest variety of standard general-purpose and definite-purpose motors to choose from—some 1600 in all. Second, General Electric motor-exchange and repair-service plans have been developed on a country-wide scale to give prompt, low cost motor repair or replacement service to your customers. Finally, in all G-E motors you get the quality extras which standards can't cover. You get the benefit of the newest developments in bearing design, insulation, and winding techniques. You get the best possible protection against electrical breakdown and mechanical wear and tear.

* *Definite-purpose motors are standard motors specifically designed for jobs where general purpose motors (built for broad application) are not ideally suited.*

GENERAL ELECTRIC

700-82

. . . Because they constantly deliver

MORE GRINDING PRODUCTION PER DISC

Speed-Wet Metalite Fibre Discs

Actual on-the-job comparisons at customer plants testify to the constant increased production of Speed-Wet* Metalite* Fibre Discs. The two illustrations above are typical examples. In the group photo Speed-Wet Discs averaged 5 to 1 times the production of their best competitor. The close-up photo shows a severe contour grinding job where Speed-Wet Discs did 12 to 1 better.

Technically, the answer to this extra production performance of Speed-Wet Discs lies in their all-fibre backing and resin bonding. The all-fibre backing withstands flexing like a steel spring. The heat-set resin bonding resists cutting heat and retards grit-shedding and glazing.

Phone, wire, or write us for a free on-the-job test of Speed-Wet Discs in your own plant.

** Reg. U. S. Pat. Off.*

BEHR-MANNING · TROY, N.Y.
(DIVISION OF NORTON COMPANY)

(*Continued from page* 238)

mands of organized labor for higher wages will be the main cause of another depression, if it comes. "I cannot conceive of an orderly retreat from the position we have now reached", he said. "The only solution is for us all to work harder and longer." Referring to an "unreal state of economy since 1939" owing mainly to priorities and credit, he said that the quality of goods is now improving as a result of the resumption of competitive selling.

James P. Ferguson, well-known instructor, outlined a course on public speaking. Members have been circularized, and if a sufficient number are interested, a ten weeks' course will be conducted by Mr. Ferguson. The resignation of R. C. Kirby, a former president and member for thirteen years, was received. Mr. Kirby has been appointed assistant superintendent of the Vancouver General Hospital. George Morrow was elected national director for the balance of the year in place of Brad Watson.

Fifty-five members attended the luncheon preceding a plant visit to Vancouver Engineering Works Ltd. on January 28. In the evening, the regular monthly educational meeting was addressed by John Gould, prominent Vancouver barrister, on the subject, "A Lawyer Looks at an Escalator Clause." Discussion followed.

RHODE ISLAND ASSOCIATION HOLDS GOVERNOR'S NIGHT

The Annual Governor's Night meeting of the Rhode Island Purchasing Agents Association was held on January 26 in the ballroom of the Narragansett Hotel, Providence, R. I. Governor John O. Pastore, chief executive of the state, was the honored guest and principal speaker.

Governor Pastore spoke on the state's primary law, and asked political leaders of both parties to "stop quarreling over master levers and impossible controversial suggestions". A question and answer period followed his talk.

CINCINNATI ASSOCIATION MEETS WITH SALES COUNCIL

The annual joint meeting of the Cincinnati Sales Executive Council and the Cincinnati Association of Purchasing Agents was held in the ballroom of the Hotel Gibson, Cincinnati, on Tuesday, February 10. The principal speaker was Colonel Jack Major, "The Man Who Makes You Laugh", noted humorist and raconteur.

The association held its annual St. Valentine's Day Dance at the Summit Hills Country Club, Dudley Pike, Kentucky, on February 14. The affair featured a midnight luncheon.

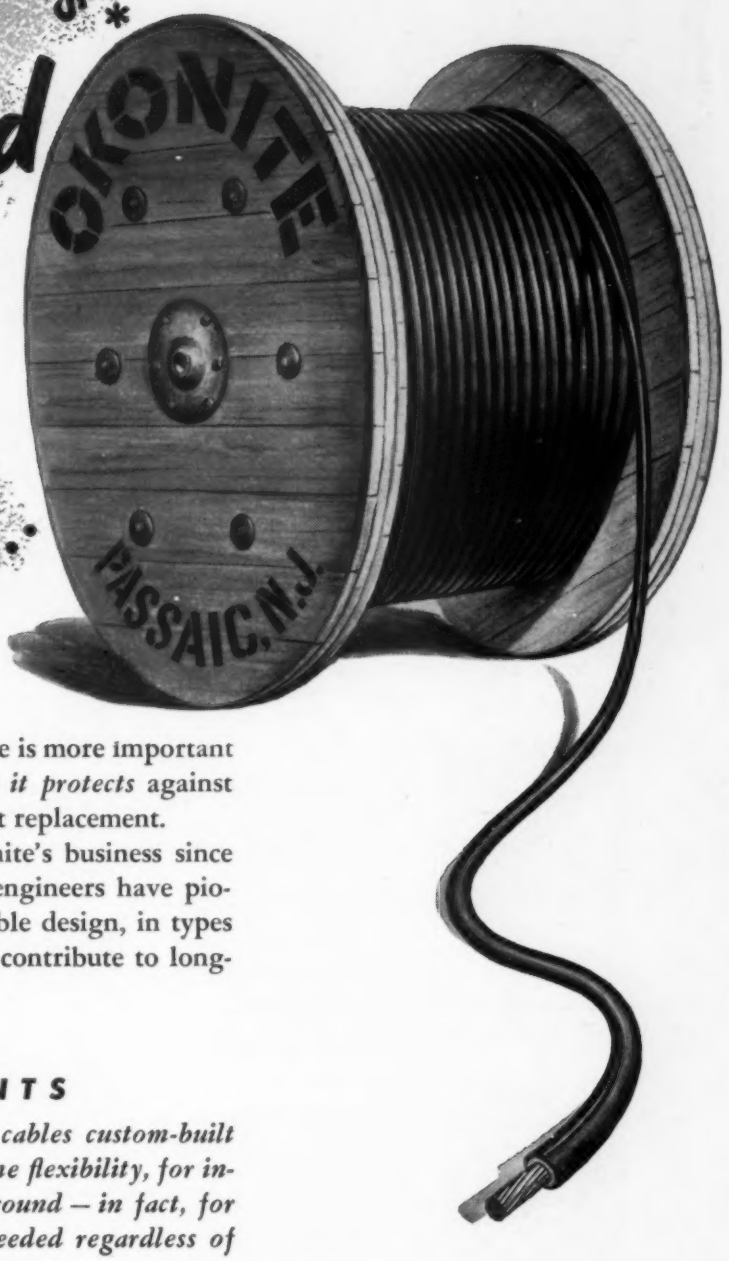
The following committees have been appointed:

Attendance—M. J. Halpin, chairman; Les Heath, J. M. Teipel, C. J. Klausing, Bill Love, L. J. Garde, Rufus Heinbuch, Jac Breese, J. Stuart Mill.

Finance—Andrew Kueffner, chairman; Bud Kessler, Milton Blersch, Harry Berlage, Harry Dick, Wilbur Muchmore,

(*Please turn to page* 244)

with today's installation costs * only the Longest-Lived will be economical...



With costs as high as they are, choosing a cable is more important than ever. And no one can afford a cable *unless it protects* against unnecessary repairs . . . against removal . . . against replacement.

Building true value into cable has been Okonite's business since 1878. In the company's seven decades, Okonite engineers have pioneered advance after advance in insulation, in cable design, in types of assemblies, in methods of manufacture which contribute to long-lived, failure-free operation.

. . . FOR INDUSTRIAL PLANTS

are specific types of Okonite wires and cables custom-built for hot spots, for wet locations, for extreme flexibility, for indoor and outdoor use above or below ground — in fact, for use wherever insulated conductors are needed regardless of the external difficulties.

What goes into an Okonite cable to make it do a better job . . . what tests it must pass . . . what care is taken to control its electrical characteristics — all this and other data are found in 32-page Research Bulletin 101. For a copy, address The Okonite Company, Passaic, N. J.

* The lifetime cost of a cable rather than its first cost is the only true measure. Okonite wires and cables, built to stand up better and longer, can offset high installation costs.

6286

OKONITE SINCE 1878 **insulated wires and cables**

THE BEST CABLE IS YOUR BEST POLICY

These are the BEST

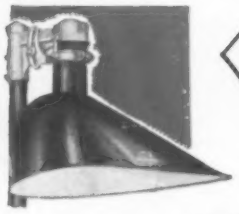
ISLAND LIGHT

Life-time porcelain enamel Reflector. Cast aluminum support and top housing. Lamp mounted base up. All wiring encased.

— without a doubt — the finest line of flood-lighting units ever to bear the famous SILV-A-KING label. And for a company which has enjoyed the reputation that has been SILV-A-KING'S for over a quarter-century — that's a lot.

SPORT AREA

Alzak aluminum floodlight. Calibrated for vertical and horizontal adjustments.

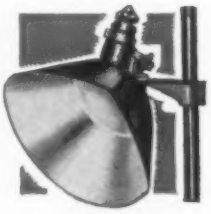


SUPER SERVICE

Life-time porcelain enamel floodlight. Calibrated for vertical and horizontal adjustments. Enclosed wiring bracket illustrated.

UNI-FLOOD

Life-time porcelain enamel floodlight. Swivel joints for complete adjustments. Open wiring bracket illustrated.



UTILITY

Floodlight of seamless, one-piece heavy-gauge aluminum. Swivel joints allow complete adjustment.

NEW CATALOG

For the complete line of SILV-A-KING Flood-lighting Units, and all other Incandescent Reflectors, send for free Catalog #50.

BRIGHT LIGHT REFLECTOR CO.

INCORPORATED

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Los Angeles, Cal.
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San Francisco, Cal.
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SILV-A-KING
LIGHTING EQUIPMENT

(*Continued from page* 242)

Bill Ries, Albert Bader, Jac Breese, Albert Closs, George DeSilver, Cliff Rehse, Arthur Tieman.

Constitution and By-Laws—A. F. Tieman, chairman; H. Fenner, A. Wheeler.

Membership—Marty Teipel, chairman; Joe Mullen, M. J. Halpin.

Educational—E. H. Cordes, chairman; W. Muchmore, J. Bossert, N. Charity.

Program—Albert Kuhn, chairman; E. L. Clayton, L. G. Pochat, Andrew Lincoln.

Entertainment — Clarence E. Doppler, chairman; Albert Bader, H. C. Berlage, Milton Blersch, Albert Closs, Ray F. Tepe, Andrew Kueffner, Ray Potts, J. M. Teipel, Arthur Tieman, W. N. Muchmore, Wm. McK. Reis, Jos. T. Mullen, Richard Rinschler, Harry Dick, Harry Fenner, Edward Frederick, Earl Jung, Arthur Wheeler, Earl Cannon, Elbert O. Schriver.

Purchasor—Arthur Wheeler, chairman; Jac Breese, Ed Frederick, Arthur Tieman, Andrew Lincoln;

Welfare—Harry Fenner, chairman;

National affairs—Cliff Rehse, chairman;

Publicity—Harry Dick, chairman.

PLASTICS FILM SHOWN AT TORONTO MEETING

The first 1948 meeting of the Purchasing Agents Association of Toronto, held January 14 at the Royal York Hotel, featured a 30-minute 16mm film entitled the "Story of Tenite". The picture is a recent release of the Tennessee Eastman Corporation and is regarded as one of the most informative films on plastics thus far produced. Robert R. Moore, Toronto representative of the company, attended the meeting and answered questions pertaining to plastics following the showing of the film.

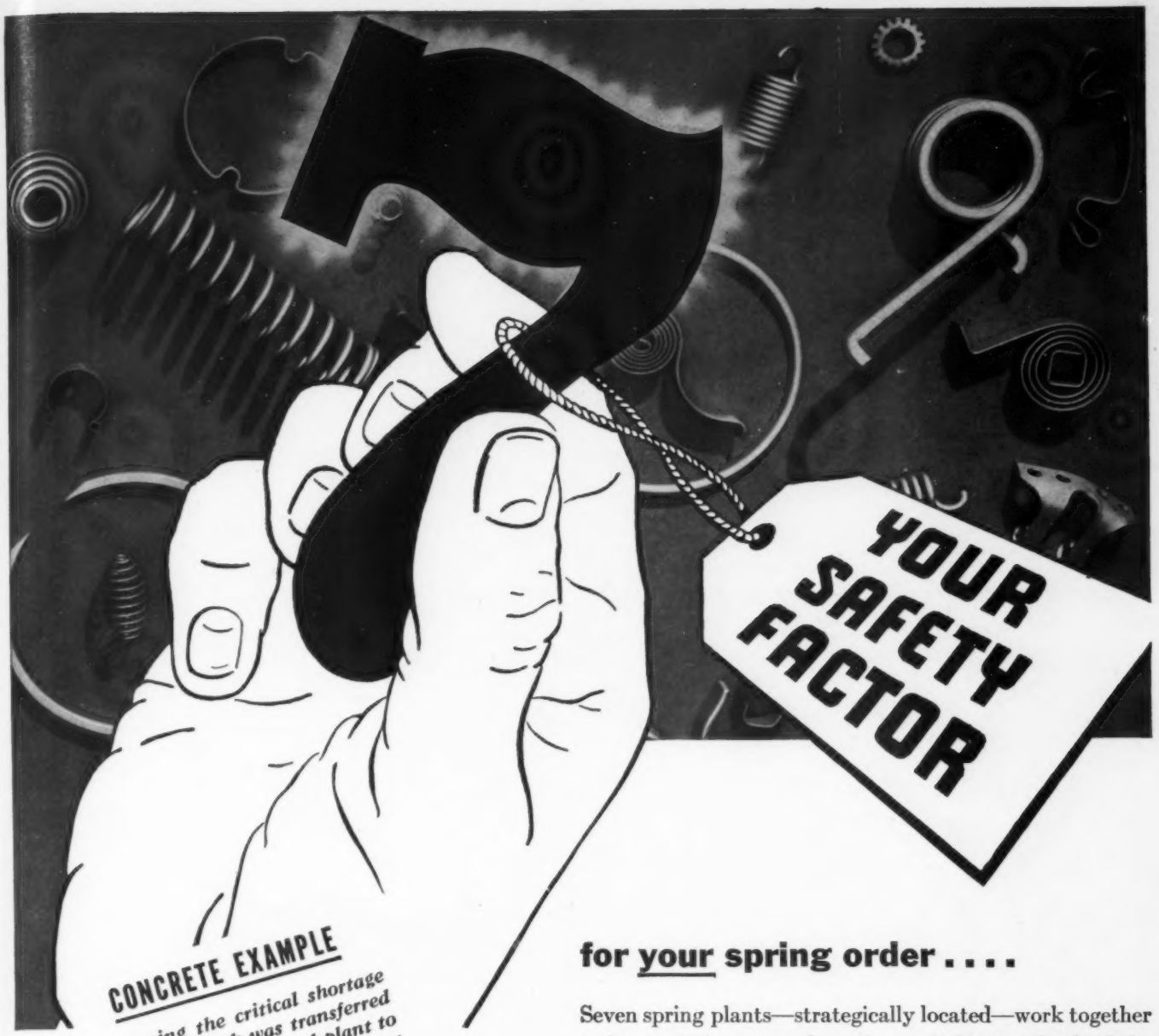
LANCASTER CLUB MEMBERS ATTEND JOINT MEETING

Members of the Purchasing Agents Club of Lancaster, Pa. were guests at a meeting on February 6, jointly sponsored by four industrial supply houses of that city; Herr & Company, Raub Supply Co., Steinman Hardware Co., and Reilly Brothers & Raub. The meeting was held at the Hamilton Club.

UTAH ASSOCIATION HEARS RADIO EXECUTIVE

The regular monthly meeting of the Purchasing Agents Association of Utah was held on Thursday, February 12 at Covey's New America Coffee Shop, Salt Lake City. Ralph W. Hardy, executive assistant in charge of publications and chairman of radio station KSL was guest speaker. Mr. Hardy was named the "outstanding young man of Salt Lake City" in 1946, and is chairman of the educational committee of the National Association of Broadcasters. R. Hulbert Keddington of the Beneficial Life Insurance Co. offered several vocal selections.

(*Please turn to page* 246)



CONCRETE EXAMPLE

During the critical shortage of gas, work was transferred from one Associated plant to another, thereby insuring delivery to customers.

for your spring order . . . .

Seven spring plants—strategically located—work together to insure uninterrupted service to industry. Back of the plant you may do business with are other plants—equally qualified to assume production of your spring order—if needed. Enjoy this protection and service and select *your* spring source from the line-up below with confidence that your orders will have a safety factor of seven.

SPRINGS ▪ SMALL STAMPINGS ▪ WIRE FORMS

Original Divisions of the Associated Spring Corporation

WALLACE BARNES COMPANY
BRISTOL, CONNECTICUT

THE WILLIAM D. GIBSON COMPANY
1800 CLYBOURN AVE. CHICAGO 14,

RAYMOND Manufacturing COMPANY
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BARNES-GIBSON-RAYMOND
6400 MILLER AVE., DETROIT 11, and ANN ARBOR, MICH.

. . . . AND DUNBAR BROTHERS COMPANY DIVISION, BRISTOL, CONN.
OHIO DIVISION, 1712 EAST FIRST STREET, DAYTON, OHIO
IN CANADA, THE WALLACE BARNES CO., LTD., HAMILTON, ONT.

"Single-edge 'Blu-Mol'* blades are helping us set new cutting records"

Shops where the majority of cutting is in hard, tough steel, are using "Blu-Mol" High Speed Blades with remarkable results. They are getting outstanding performance, accurate cutting, and economy from these high speed molybdenum blades . . . faster, truer, tougher cutting that pays dividends.

"'Blu-Mol Double-Life'* blades give us rock-bottom cutting costs"

"Blu-Mol Double-Life" High Speed Blades are the choice of shops where cutting conditions are carefully supervised and controlled. In forge shops, for instance, where blades must stand up while cutting billets day after day, "Double-Life" blades are giving the lowest cost per cut of any blade ever produced! With a double-edge blade you actually get twice as many cuts at a cost only 50% greater.

Floating Tension *an important plus*

Take the superior performance of a "Blu-Mol" Blade and couple it with "Floating Tension" as delivered by the "*Tensiometer.*"* Result: the lowest cutting costs and highest quality work you've ever seen. Ask about this exclusive Millers Falls development that sets and *maintains* any tension up to 4000 lbs. on your blades, absorbing shocks and minimizing breakage.

** Trade Marks Registered U. S. Patent Office*

Millers Falls "Blu-Mol" Blades

are distributed exclusively through selected distributors. For a free demonstration of unusual hacksawing efficiency and "floating tension", on your own machines, write to us.

MILLERS FALLS COMPANY
Greenfield • Massachusetts

MILLERS FALLS TOOLS

(*Continued from page* 244)

The association held a "Sweetheart's Party" Valentine dance at the Golden Dragon, on February 14. Dinner and dancing featured the affair, which was presented without charge by the association.

ALL MISSISSIPPI PURCHASING AGENTS ELIGIBLE

G. W. Leep, president of the recently organized Purchasing Agents Association of Jackson, Miss., announces that membership in the Association is open to all bona-fide purchasing agents in the State of Mississippi. Mr. Leep is purchasing agent for the Mississippi Products, Inc., Jackson.

PURCHASING-ENGINEERING RELATIONS: N.W. PENNA.

The regular meeting of the Purchasing Agents Association of Northwestern Pennsylvania was held at the Blue & White Restaurant, Warren, Pa. on January 8. Discussion on the education program topic "How To Strengthen Relations Between Purchasing and Engineering Production" was led by C. H. Holden of the Raymond Mfg. Co.

Reports were given and discussion held on various commodities as follows: steel, led by Harry Ledebur, Hammond Iron Works; fuel oil, led by Louis Cooney, National Forge and Ordnance.

WASHINGTON ASSOCIATION HOLDS MID-WINTER PARTY

The Purchasing Agents Association of Washington held its annual midwinter party at the D.A.R. Hall, Seattle, on February 7. Attendance was limited to members of the association, their wives, husbands, girl or boy friends. Included on the program were: dinner, bingo, dancing, punch bowl, and door prizes. Tickets were $2.00 per person.

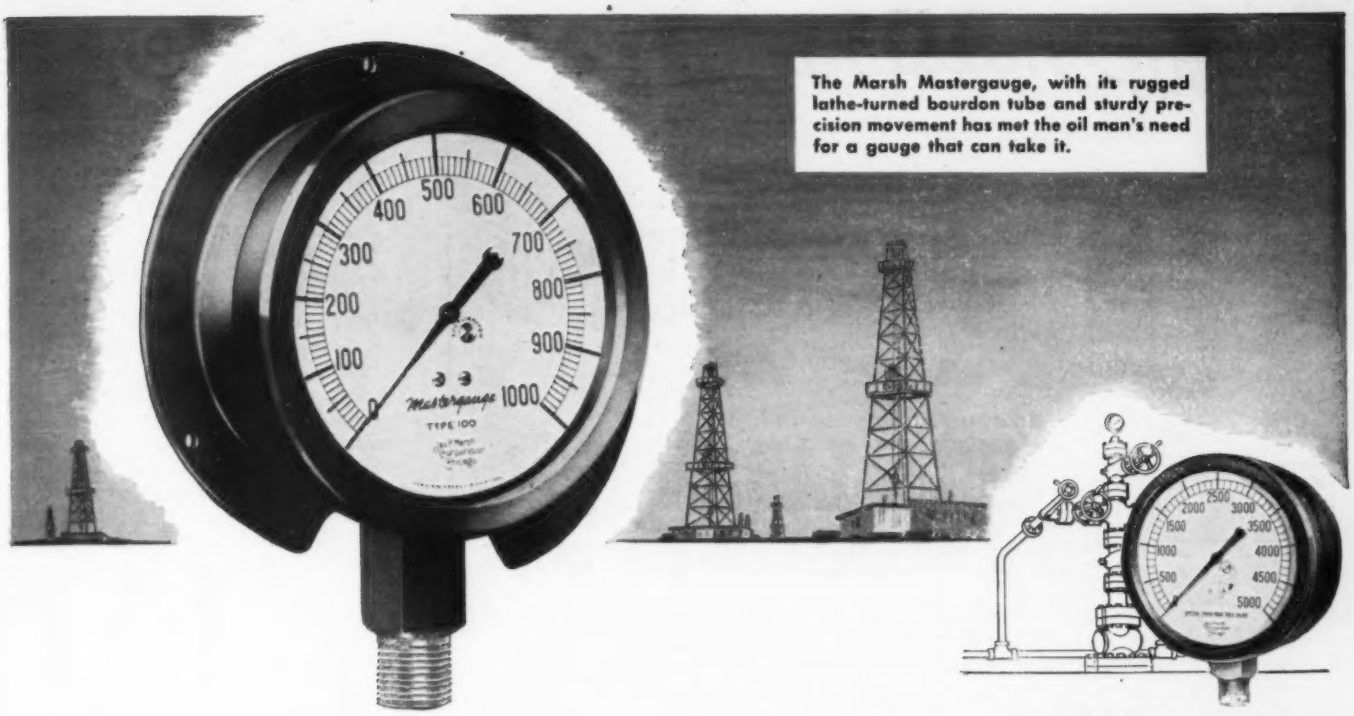
TALKS ON EUROPEAN TOUR TO WASHINGTON ASSOCIATION

The Purchasing Agents Association of Washington held its regular monthly meeting at the American Legion Building, Seattle, on February 12. Frank West, president of the Preservative Paint Co. of Seattle was the guest speaker. He talked on his recent tour of Europe, and showed pictures taken during the trip. Also shown was a film entitled "Fresh and Good Looking", based on packaging. It was shown through the courtesy of the Zellerback Paper Co.

NATIONAL OFFICERS GUESTS OF CENTRAL ONTARIO ASSN.

Top officers of the National Association of Purchasing Agents and the Canadian Council attended the January 27 meeting of the Purchasing Agents Association of Central Ontario, held at the Grand River Tea Rooms, near Freeport. Garnet Dickson, president of N.A.P.A., George A.

(*Pelase turn to page* 248)



The Marsh Mastergauge, with its rugged lathe-turned bourdon tube and sturdy precision movement has met the oil man's need for a gauge that can take it.

Oil men call these tree-like piping assemblies "Christmas trees." Marsh "Christmas Tree" Gauges are widely used for this service—some of them on the highest pressure oil well in the world.

Throughout the oil country

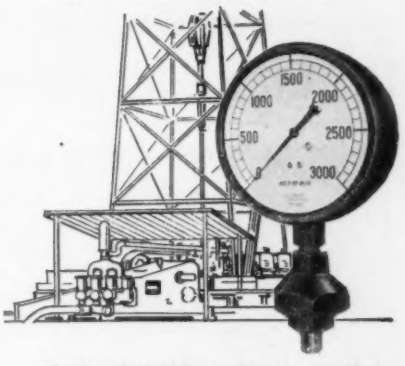
Marsh is the gauge!

When you run across a particularly tough problem of pressure measurement in any branch of industry, it's a pretty safe bet you'll find a Marsh Pressure Gauge in full charge of the situation. And there is no better place to see this than in the production phase of the petroleum industry.

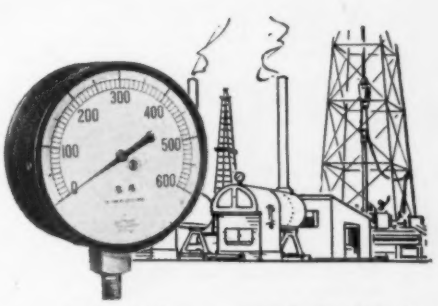
Out in the oil country you find every kind of punishment a pressure gauge can be asked to undergo. Sometimes it's extreme pressure; sometimes, extreme temperature; sometimes, racking vibration or relentless pulsation; often, all of these at once. In dealing with such conditions, oil men have become about the toughest critics of pressure gauges; so the preference they have shown for Marsh instruments is a remarkable tribute to Marsh accuracy and stamina.

Yes, Marsh is the oil country's own gauge—first choice of a great field where precision and ruggedness is a law unto itself. Yet this is only one example of the preference shown in many fields by men who know pressure gauges forward and backward.*

Keep this in mind when you select pressure gauges. Why accept less than the instruments preferred by the most critical of pressure gauge users?



The Marsh Mud Pump Gauge, popular in the oil country, is an excellent example of Marsh specialization.



Marsh is the gauge on the familiar oil country boilers.

JAS. P. MARSH CORPORATION, Dept. G, Skokie, Illinois

Export Dept.: 155 E. 44th St., New York 17, N. Y.

Jas. P. Marsh products include: A full line and range of gauges in pressure, vacuum compound, altitude, hydraulic, sprinkler, ammonia, ounce-graduated retard, test, and diaphragm types. Dial thermometers in rigid stem and remote reading types. A broad line of steam and hot water heating specialties. Ask for literature.

MARSH GAUGES

"THE STANDARD OF ACCURACY"

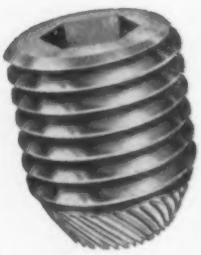
Marsh alone has the "Recalibrator"

—quickest and best way to correct a gauge that has been knocked out of adjustment by improper handling.

* One of a series of advertisements citing examples of this.

many millions in use

Pat'd. & Pa.s. Pend.



UNBRAKO

Reg. U. S. Pat. Off.

Knurling of Socket Screws originated with "Unbrako" in 1934.

SELF-LOCKERS

CAN BE USED OVER AND OVER AGAIN

The "Unbrako" Socket Set Screw with the Knurled Cup Point is a *Self-Locker*—its cleverly knurled point holds tight—regardless of the most chattering vibration. Yet, it can be backed-out and used over again and again. Many, many millions in use,—and no wonder! Available in sizes from #4 to 1½" in diameter; full range of lengths. Write for your copy of the "Unbrako" Catalog.

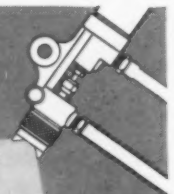
"Unbrako" Products are sold entirely through Industrial Distributors.

OVER 45 YEARS IN BUSINESS

STANDARD PRESSED STEEL CO.

JENKINTOWN, PENNA., BOX 590 • BRANCHES: BOSTON • CHICAGO • DETROIT • INDIANAPOLIS • ST. LOUIS • SAN FRANCISCO

ECLIPSE spray equipment for Acme liquid compositions . . .



Now exclusively distributed by H-VW-M

Improves Buffing—Lowers Costs

Profit from the advantages of spray application of liquid buffing compounds with equipment planned for that purpose. Eclipse *Pressure Feed* Spray Equipment for use with liquid buffing compositions is now exclusively distributed by Hanson-Van Winkle-Munning Company.

Equipment is available in single or multiple units for use with your present buffing equipment. Operation can be manual or fully automatic.

Thoroughly tested in actual production, Eclipse pressure-type spray application of oil base liquid compounds—such as Acme Tripoli—has proved highly efficient and economical.

Whether manually or automatically operated, Eclipse Spray Guns leave operator's hands free for uninterrupted production, increase buff life, simplify cleaning after buffing, and save appreciable composition . . . contribute in all to better buffing at lowered costs.

H-VW-M is prepared to supply complete installations and service. Standard equipment includes gun, five-gallon pressure container, foot pedals, necessary length of air and fluid hose and accessories. Write for details.

For best results, the following grades of Acme Liquid Compositions are recommended for use with pressure type spray equipment:

GRADE	CHARACTERISTICS
2-L-70	Double duty cutting with superior color.
2-L-77	Good cutting with medium color.
2-L-79	Heavy cut with medium color.
4-L-10	Coloring composition for: nickel, brass, copper, aluminum, die castings.

HANSON-VAN WINKLE-MUNNING COMPANY

MATAWAN, NEW JERSEY

Manufacturers of a complete line of electroplating and polishing equipment and supplies

Plants: Matawan, New Jersey • Anderson, Indiana
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SINCE 1820

3405

(*Continued from page* 246)

Ireland, president of the Canadian Council and Charles Fullerton, secretary of the Canadian Council, were the guests.

In his address, Mr. Dickson spoke of association affairs and growth, both in numbers and financial strength. "Our association is becoming truly international," he said, "for we have a branch in Mexico, a proposed one from Hawaii, and similar associations from England and France are interested in our activities. The composite opinions of such a large number of purchasing men are highly valued by industry and industrial economists, and the forecasts of business conditions, and recommended buying policies as published regularly by the national association are recognized as being among the best."

Mr. Dickson recommended a policy of watchful and careful buying. Present inflated values, he warned, cannot last, and it would be well for all purchasing men to watch market trends carefully to avoid being caught with high priced inventories.

"1948 BUSINESS FORECAST" AKRON ASSOCIATION

The Purchasing Agents Association of Akron held its annual "Executive Night" meeting at the Woman's City Club on February 17. Paul E. Belcher, secretary of the First National Bank of Akron, guest speaker, gave his 1948 business forecast.

The January 20 meeting, at the Woman's City Club, featured an address by attorney Dudley W. Maxson on the Taft-Hartley law. The University of Akron has begun its regular course in purchasing for the spring session, with association member Bill Lantz, purchasing agent of Sun Rubber Co., as instructor. The classes meet once a week for two hours.

BUFFALO ASSOCIATION HEARS COMMODITY PROGRAM

Discussion of current fuel conditions featured the regular commodity program meeting of the Purchasing Agents Association of Buffalo. Chief speakers were William Bennett vice-president, and R. J. Babor, vice-president in charge of supply and distribution, of the Frontier Oil Refining Co., and T. A. Day, a member of the public relations staff of Bituminous Coal Association, a department of the National Coal Association. A sound film, entitled "The Magic of Coal", was shown following the talks.

ANNUAL EXECUTIVE NIGHT MEMPHIS ASSOCIATION

The Memphis Purchasing Agents Association held its annual "Executive Night" dinner meeting recently at the Hotel Peabody. The keynote of the program was "Purchasing Trends for 1948".

Subjects included, "Production", by T. W. Lewis, president, Lewis Supply Co.; "Manufacturing", Hugh Allen, president, Rotary Lift Co.; "Transportation", W. E. Lamb, president, Memphis Union Station;

(*Please turn to page* 250)

There is no problem in sheet or strip fabrication that is completely new to

WEIRTON

Change your product design, change your dimensions, change your finish—and you have created a new problem in steel. But we have solved so many like it, there is hardly any doubt that we can solve yours.

Your problem in buying steel, when put up to Weirton, gets attention from those within our organization best qualified to give you the right answers.

Our specialists see eye-to-eye with you and look at your problem from your side of the desk. First, they serve you. Then they serve Weirton. Only in that way can you get what you hope for . . . real help on your steel problem.

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FLEXIBLE SHAFTS BLINDFOLDED

Not that it doesn't matter which flexible shafts you buy. The point is, you can tell little about flexible shafts by looking at them, for they all look just about the same. But there are important differences—and these differences determine efficiency, ease and smoothness of operation, reliability and service life. In fact, performance is the only true basis of flexible shaft selection. On this basis you will find maximum value in

S.S.WHITE FLEXIBLE SHAFTS

It is the assurance of superior performance and long, trouble-free service that has led many flexible shaft users to conclude — there is no "or equal" for S.S.White flexible shafts.

FLEXIBLE SHAFT FACTS FOR YOU

BULLETIN 4501 gives plenty of useful information about flexible shafts and describes the principles of their selection and application. Write for your free copy —and ask for some for your engineering department.

S.S.WHITE INDUSTRIAL DIVISION

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FLEXIBLE SHAFTS • FLEXIBLE SHAFT TOOLS • AIRCRAFT ACCESSORIES
SMALL CUTTING AND GRINDING TOOLS • SPECIAL FORMULA RUBBERS
MOLDED REVISIONS • PLASTIC SPECIALTIES • CONTRACT PLASTICS MOLDING

One of America's AAAA Industrial Enterprises

(Continued from page 248)

"Retailing and Wholesaling", H. G. Orndorff, secretary-treasurer, Loewenstein's; and "Overall Prediction of the Memphis Trade Area", O. F. Sodestrom, Director of Commerce and Transportation for Memphis Chamber of Commerce.

New members of the association include Raymond C. Moen, Fairbanks-Morse Co., Stuttgart, Ark., Stanley S. White, John A. Denie's & Sons, and C. J. Reed, Pritchard Bros.

STAINLESS STEELS SUBJECT OF TULSA ASSN. MEETING

The Purchasing Agents Association of Tulsa held a regular open meeting on February 10 at the Tulsa Building. Guest speaker was George C. Kiefer, associate director of research, Allegheny Ludlum Steel Corp., Pittsburgh, Pa., whose subject was "Stainless Steels". A technicolor motion picture, "Corrosion", was shown in conjunction with the talk.

On February 28 association members visited the plant of the Frank Wheatley Pump and Valve Mfr., Tulsa. All employees of the members' purchasing departments were invited to join in the visit.

GOLFER DALLAS ASSN. GUEST

Byron Nelson, noted professional golfer now retired from regular tournament participation, was the principal speaker at the regular meeting of the Purchasing Agents Association of Dallas on January 8 at the Melrose Hotel. He spoke on the recent Ryder Cup matches.

CHATTANOOGA MEETING

The regular monthly meeting of the Purchasing Agents Association of Chattanooga was held Tuesday, January 13, at the Hotel Patten. Guest speaker was Raymond C. Adams, head chemist with the Gilman Paint and Varnish Company, Chattanooga, on the topic "What Is Paint?"

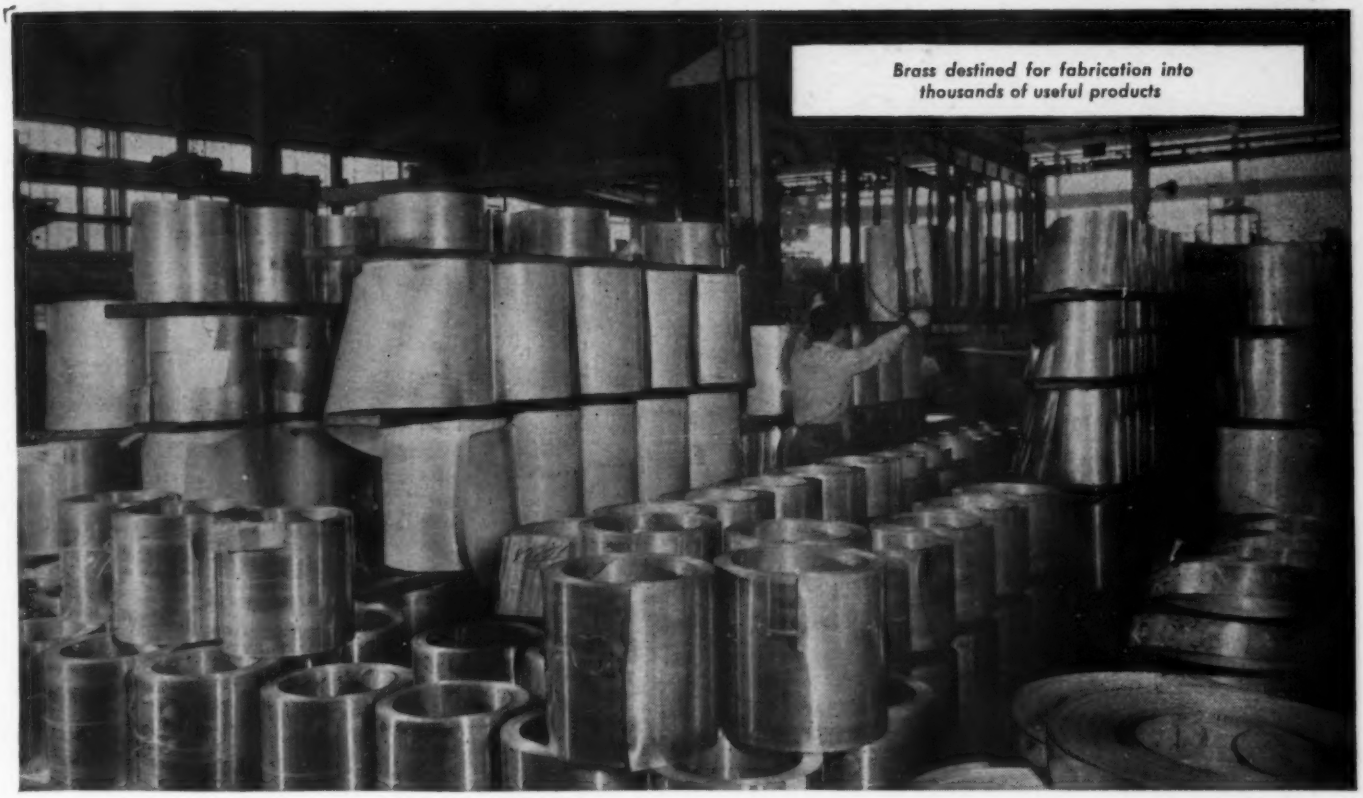
CONNECTICUT ASSOCIATION HEARS TALK ON SUBCONSCIOUS

The January 27 meeting of the Purchasing Agents Association of Connecticut, held at the Hotel Garde, New Haven, heard a talk by Dr. Everett S. Rademacher of the Yale University psychiatric clinic. Dr. Rademacher talked on the subconscious mind and how it affects our daily doings. The talk was accompanied by sound motion pictures.

"P.A.'S BUYING TECHNIQUE" NEW ORLEANS ASSOCIATION

"The Purchasing Agents Buying Technique" was the discussion subject of a meeting of the educational committee of the Purchasing Agents Association of New Orleans, held at the New Orleans Public Service, Inc., on January 22. The highlight of the meeting was a 30-minute

(Please turn to page 252)



Brass destined for fabrication into thousands of useful products

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A DEPENDABLE SOURCE FOR QUALITY BRASS MILL PRODUCTS

The strategic location of Bridgeport's Indianapolis mill, situated in the heart of the midwest, assures overnight deliveries to many leading manufacturing centers in that area. These modern facilities for the production of quality brass mill products are also benefiting metal fabricators in the Northwest, Southwest and Pacific Coast areas.

With large, up-to-date mills at Bridgeport and Indianapolis and a network of well-stocked warehouses, located in many active manufacturing centers throughout the country, Bridgeport is in a strong position to render the best possible service to customers on a nation-wide basis.

Bridgeport offers the specialized skills and technical knowledge of men long familiar with all phases of brass making and the application of copper-base alloys in a wide variety of products. Contact the nearest Bridgeport office for service and for assistance in metal specifications problems.

"Bridgeport" BRASS CO.

BRIDGEPORT BRASS COMPANY

BRIDGEPORT 2, CONN. • *Established 1865*

Mills at Bridgeport, Connecticut, and Indianapolis, Indiana.
In Canada—Noranda Copper and Brass Limited, Montreal

BRASS • COPPER • BRONZE • DURONZE • SILICON BRONZE • ALUMINUM BRONZE
CUPRO NICKEL • NICKEL SILVER • Rod • Strip • Wire • Tubing

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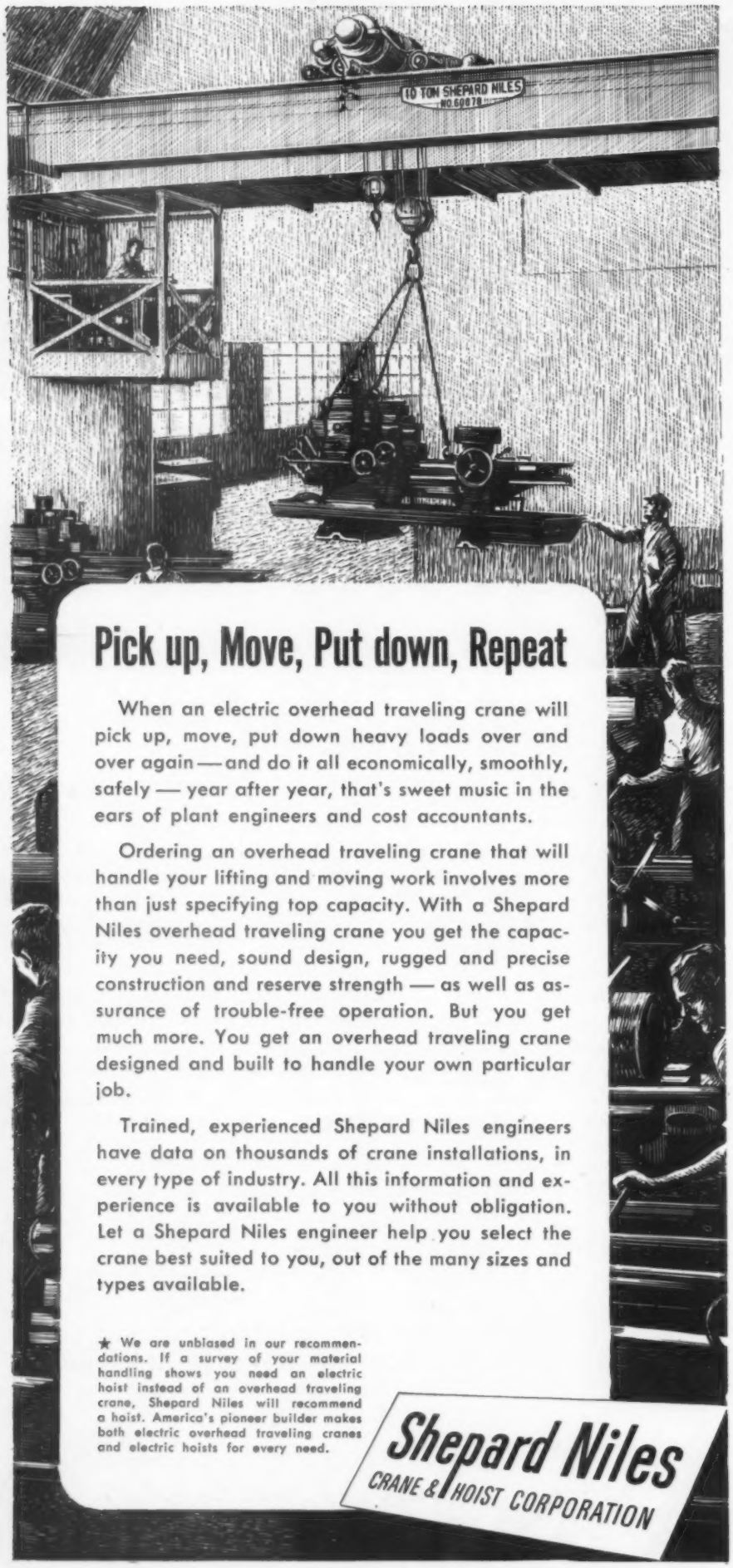
Cincinnati 2, Ohio.....1703 Carew Tower
★ Cleveland 6, Ohio.....1921 E. 119th Street
★ Denver 2, Colorado.....1962 Blake Street
Detroit 26, Michigan.....2328 Buhl Bldg.
Grand Rapids 2, Mich..510 Assoc. Com. Bldg.
★ Houston 1, Texas.....2216 Walker Avenue
Indianapolis 4, Indiana...Circle Tower Bldg.
Jacksonville, Florida..5133 Appleton Avenue
★ Los Angeles 12, California..130 S. Hewitt St.
Milwaukee 2, Wisconsin, 715 N. Van Buren St.
★ Minneapolis 1, Minnesota..100 N. Second St.
★ Newark 8, New Jersey.....325 Jelliff Avenue
New York 17, New York..420 Lexington Ave.
New York—Jobber Stocks Available
Philadelphia 3, Penn.....Broad St. Sta. Bldg.
Pittsburgh 19, Pennsylvania, 1322 Gulf Bldg.
★ Providence 3, Rhode Island...60 Clifford St.
Rochester, New York..816 Reynolds Arc. Bldg.
★ St. Louis 3, Missouri.....2135 Delmar Blvd.
St. Paul 5, Minnesota...703 Ashland Avenue
★ San Francisco 3, California...1155 Bryant St.
Washington 5, D. C..616 Southern Building

Brass-Bronze-Copper-Duronze

STRIP ROD WIRE TUBING

BRIDGEPORT BRASS



Pick up, Move, Put down, Repeat

When an electric overhead traveling crane will pick up, move, put down heavy loads over and over again — and do it all economically, smoothly, safely — year after year, that's sweet music in the ears of plant engineers and cost accountants.

Ordering an overhead traveling crane that will handle your lifting and moving work involves more than just specifying top capacity. With a Shepard Niles overhead traveling crane you get the capacity you need, sound design, rugged and precise construction and reserve strength — as well as assurance of trouble-free operation. But you get much more. You get an overhead traveling crane designed and built to handle your own particular job.

Trained, experienced Shepard Niles engineers have data on thousands of crane installations, in every type of industry. All this information and experience is available to you without obligation. Let a Shepard Niles engineer help you select the crane best suited to you, out of the many sizes and types available.

★ We are unbiased in our recommendations. If a survey of your material handling shows you need an electric hoist instead of an overhead traveling crane, Shepard Niles will recommend a hoist. America's pioneer builder makes both electric overhead traveling cranes and electric hoists for every need.

Shepard Niles
CRANE & HOIST CORPORATION

462 SCHUYLER AVENUE • MONTOUR FALLS, N. Y.

(*Continued from page 250*)

16 mm motion picture, produced by the Johns-Manville Corporation, entitled "Mr. Craig Has The Floor". The picture illustrates an interview between the salesman and the purchasing agent.

Discussion leaders were T. W. Born, R. N. Dowling, and N. J. Gubler. The meeting was the first in a series of five on the subject, "How To Buy". Members were invited to bring assistants or guests with them to the meeting.

CHICAGO WOMEN'S DIVISION

The February 12 meeting of the Women's Division of the Purchasing Agents Association of Chicago was held at the Civic Opera Building. A film entitled "The Gift of T'Sai Lun—Paper", was shown through the courtesy of the Chicago Paper Co.

"RESEARCH AND BETTER VIEW" SYRACUSE & CENTRAL N. Y.

The regular monthly meeting of the Purchasing Agents Association of Syracuse and Central New York was held in the roof garden of the Onondaga Hotel, Syracuse, N. Y. on February 25. Dr. Walter A. Dew, eastern manager, Public Relations Department, E. I. Du Pont de Nemours & Co., Wilmington, Del., was guest speaker, on the subject "Research and Better View".

The January 28 meeting featured an address by Dr. Sidney C. Sufrin, College of Business, Syracuse University, former economic advisor for the U. S. State Department, on the Marshall plan and its effects on the nation's business.

ERIE ASSN. APPLIES FOR MEMBERSHIP IN N.A.P.A.

Formal application for membership in the National Association of Purchasing Agents was made on January 21 at the regular meeting of the Purchasing Agents Association of Erie. The application was made through L. A. Anderson, N.A.P.A. vice-president for District 6, who was the principal speaker at the meeting.

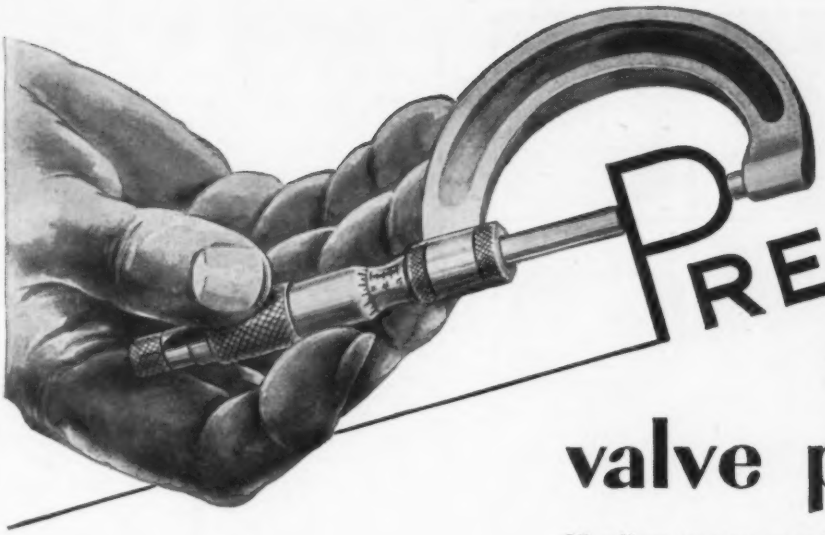
LEHIGH VALLEY MEETING

A discussion on commodities featured the regular meeting of the Purchasing Agents Association of Lehigh Valley a. the Colonnade, Bethlehem, Pa., on January 27. Plans were made to meet with the Reading association on April 7, when Garnet Dickson, N.A.P.A. president will be honored.

WILMINGTON GROUP HEARS INVESTMENT COUNSELOR

Meeting at the Hotel DuPont, Wilmington, on January 26, the Wilmington Industrial Purchasing Agents, heard a talk by J. Morton Baxter, investment counselor, on the psychological factors influencing the "capital formation" sector of the national economy.

(*Please turn to page 254*)



PRECISION ...the key to efficient valve performance

Needless to say, a valve must operate with precision to perform efficiently in actual service. But to make this possible there must be precision in everything that goes before—precision in design, in selection of materials, and in finishing to exact specifications.

Throughout more than a century of making valves—and valves only—"precision" has been the watchword at Powell. That is why today, in every branch of industry, Powell Valves are noted for efficiency under any and all service conditions.

And don't forget that Powell Engineers are always glad to help you select the precise valves to meet your individual flow control requirements.

The Wm. Powell Co., Cincinnati 22, Ohio

DISTRIBUTORS AND STOCKS IN ALL PRINCIPAL CITIES

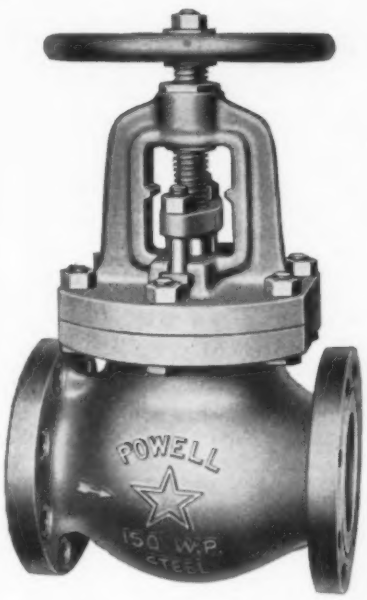


Fig. 1531

Fig. 1531—Class 150-pound Cast Steel Globe Valve with flanged ends, bolted flanged yoke and outside screw rising stem.

Fig. 500—125-pound Bronze Gate Valve with screwed ends, screwed-in bonnet, inside screw rising stem, and either taper wedge solid or double disc.

Fig. 560—200-pound Bonze Regrinding Horizontal Swing Check Valve with screwed ends, screwed on cap and regrindable, renewable bronze disc.

Fig. 241—Large 125-pound Iron Body Bronze Mounted Globe Valve. Made in sizes 2" to 16", inclusive. Has outside screw rising stem, bolted flanged yoke and regrindable, renewable bronze seat and disc. Also available in All Iron for process lines.

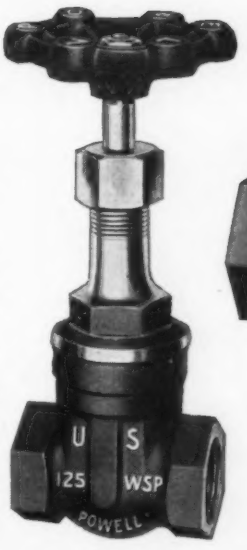


Fig. 500

Fig. 560

Fig. 241

POWELL VALVES

Gentlemen!
Before you say "Go" on that new product--
— give sober thought to the springs. They can make or break your product. If they fail, the product fails . . . always in the user's hands!
Our engineers have fitted the spring to the need for many years. Before approving your product, take just a little more time and let us help with the springs. We will check your specifications against your blue prints without obligation, and in confidence. If our experience indicates they are all right, we will say so. If they can be improved, we will also say so. In all events, we will be prompt.
PECK
SPRINGS & SCREW MACHINE PRODUCTS
THE PECK SPRING COMPANY
40 WELLS ST. PLAINVILLE, CONN.

(*Continued from page 252*)

He defined capital formation as the total value of construction, the production of durable goods and inventory accumulation. He indicated how developments in government, money and banking can influence this figure, and predicted the first warning of the end of inflation would be a leveling off and finally a drop in commodity prices.

ROCHESTER BUYERS HEAR "WHAT MANAGEMENT EXPECTS"

The regular meeting of the Rochester Association of Industrial Buyers was held at the Normandie Hotel on Tuesday, February 10. Speaker of the evening was Larry Martin, assistant to the manager of Camera Works, Eastman Kodak Company, whose topic was "What Management Expects of the Buyer".

Following the speaker there was a short discussion session on "Follow-Up Procedure". Several members of the Purchasing Agents Association of Rochester were on hand to offer their ideas on the subject.

FOUNDRYMEN TO MEET IN PHILADELPHIA

The American Foundrymen's Association will hold its 1948 Foundry Congress and Show in the Convention Hall, Philadelphia, Pa., May 3-7. The congress is expected to attract 20,000 executives, technologists and production men. A mammoth exhibit of foundry equipment and supplies and a technical program, will feature latest production and control techniques of the field.

ORGANIZE EASTERN INDIANA PURCHASING AGENTS ASSOCIATION

The Eastern Indiana Purchasing Agents Association was recently organized with thirty charter members, and the following officers:

President, H. A. Nichols, H. & A. Selmer, New Castle, Ind.;

Vice President, Kenneth Bolen, Ward-Stilson Co., Anderson, Ind.;

Secretary, C. C. Cunningham, Warner Machine Products, Muncie, Ind.;

Treasurer, W. J. Corcoran, Swayne Robinson Co., Richmond, Ind.;

National Director, Richard Conder, Perfect Circle Co., Hagerstown;

Director, G. L. Smith, Ingersoll Steel Co., New Castle, Ind.;

Alternate Director, M. W. Goodwin, Acme-Lees, Muncie, Ind.

Meetings are scheduled to be held monthly on every third Thursday, being rotated in various cities in the district, namely, Anderson, Muncie, New Castle, Hagerstown, Richmond, Pittsville, and Rushville.

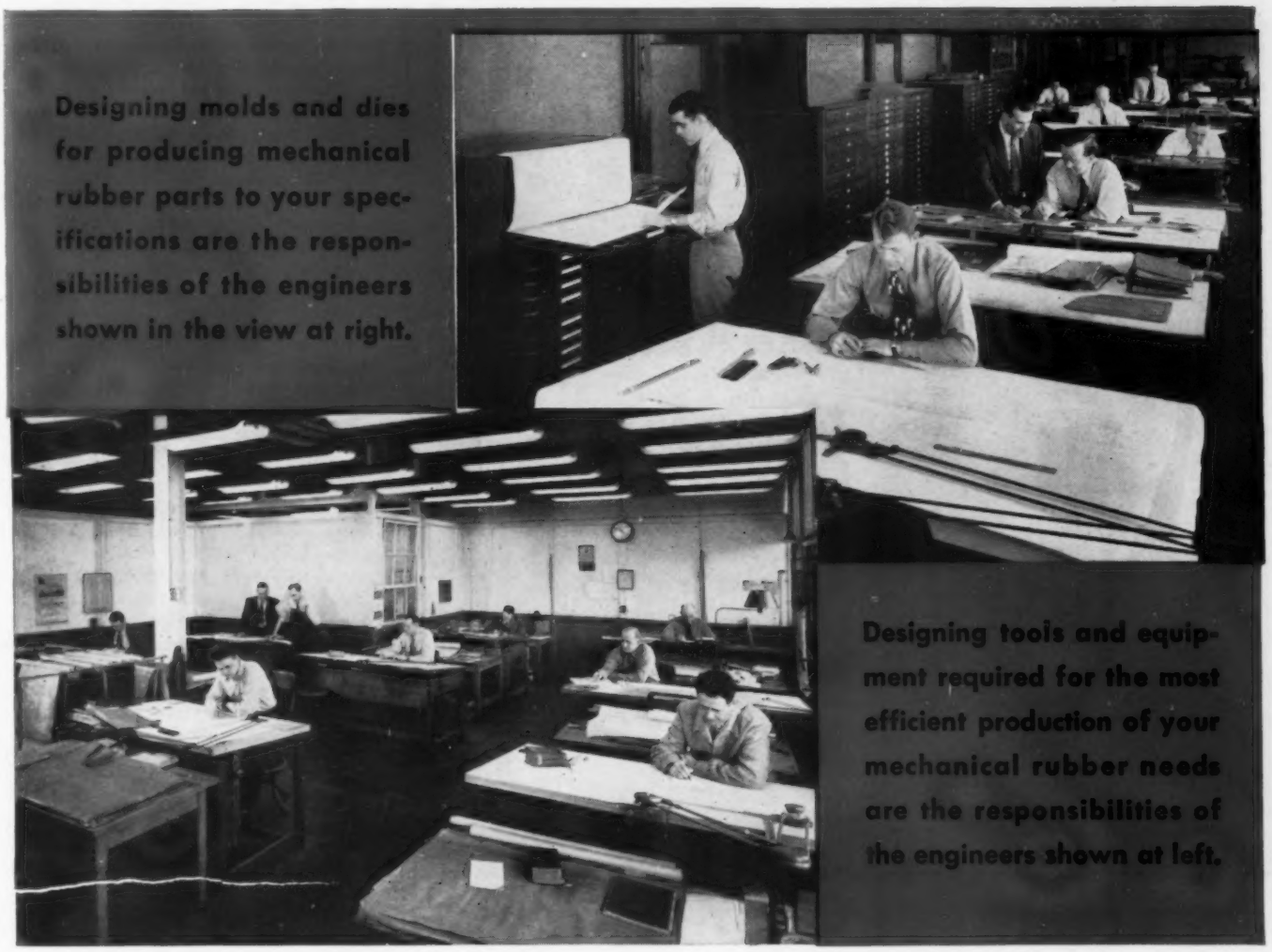
The association is one of the four new local associations recently approved for membership in the National Association at meeting of the executive committee in Indianapolis.

(*Please turn to page 256*)

How to Add Complete Rubber Engineering Facilities to Your Plant

[WITHOUT ONE CENT OF INVESTMENT BY YOUR COMPANY]

Designing molds and dies for producing mechanical rubber parts to your specifications are the responsibilities of the engineers shown in the view at right.



Designing tools and equipment required for the most efficient production of your mechanical rubber needs are the responsibilities of the engineers shown at left.

● When you refer your mechanical molded, extruded, or bonded rubber parts requirements to The Ohio Rubber Company it is almost like adding complete rubber engineering facilities to your plant. Our two specialized staffs of engineers are prepared to coordinate their skills with your engineers to attain the most efficient solutions to your problems in rubber. Suggestion: Ask us to have our representative in your area discuss details of YOUR specific requirements.

This is the 2nd of a series of messages relating to:

THE OHIO RUBBER COMPANY

WILLOUGHBY, OHIO

OHIO RUBBER CO

FACTORIES: WILLOUGHBY, OHIO • LONG BEACH, CALIF. • CONNEAUTVILLE, PA.
BRANCH OFFICES: DETROIT • NEW YORK • CHICAGO • INDIANAPOLIS • CLEVELAND • BOSTON

A COMPLETE LINE — BEST QUALITY

"Blue Devil" socket screw products are available from stock in a wide selection of standard sizes and lengths. They are made by specialists in socket screw manufacture in a plant which is entirely devoted to the manufacture of "Blue Devil" hexagon socket screw products.

Blue Devil SOCKET SCREW PRODUCTS

Sold through industrial supply distributors

Write today for Free catalog listing stock styles, sizes and prices.

SAFETY SOCKET SCREW COMPANY

4439 N. Knox Avenue, Chicago 30, Illinois
11 Park Place, New York 7, N. Y.
816 W. Fifth Street, Los Angeles 13, Calif.

DATA ON MINERAL WOOL LOW TEMPERATURE INSULATION

Recognizing the importance of insulation technique in properly planned cold storage, freezing, cooling, air conditioning, and refrigeration operations—and the scarcity of helpful selection and application data in this connection—the Industrial Mineral Wool Institute, as a service to consumers and to the trade, has just published a new 2-color 24-page manual entitled "Holding Low Temperatures With Better Insulation."

The booklet, reported to be the first of its kind, covers: how to select insulation and what to look out for; data on forms, properties and application methods; and a particularly useful chapter on the principles and significance of vapor-proofing for various types of wall, floor and ceiling construction. The work contains 15 photographs, 11 diagrams, 7 charts and tables, and analyses of typical case-history installations in (1) cold storage work, (2) freezing processes, (3) cold-aging, (4) food distribution, (5) industrial refrigeration, and (6) air conditioning.

Developed by the Technical and Service Committees of the IMWI, the book represents many months of writing, analysis and committee work, and becomes thereby a valuable reference relating to all forms and types of the non-organic, light-weight insulants and their low-temperature usage.

Particularly helpful to users will be: graphs on representative thermal conductivities of various mineral wool forms; a chart for computation of minimum insulation thicknesses to prevent condensation on cold surfaces in various environments; minimum thicknesses and recommended techniques for pipe insulation; data on long-term storage temperatures for various food products; and recommended procedures for the vapor-sealing of masonry, wood, block, and plastered walls.

Single copies are available free of charge from the Institute at 441 Lexington Avenue, New York 17, N. Y.

WESTERN PINE DIRECTORY

A new Directory of Membership has just been issued by the Western Pine Association, Yeon Building, Portland 4, Ore. This directory supercedes that of July 15, 1947 and contains more than 20 firms who were not listed in the previous issue. It is a list of firms manufacturing the Western Pines and associated species. It gives the address of each general sales office, lumber items produced and other items which are refined before being shipped to consuming areas.

LOOKING FOR SOMETHING?
. . . PUT A WANTED AD IN PURCHASING'S CLASSIFIED SECTION
SEE PAGE 334

STRENGTH

SUPERSTRONG boxes and crates—"Bound with Steel"—possess almost unbelievable strength. Made of sturdy veneer and reinforced on every side with steel wire, they give your product complete protection under the toughest shipping conditions.

We shall be glad to tell you how you can obtain SUPERSTRONG protection for your long range requirements.

RATHBORNE, HAIR AND RIDGWAY COMPANY

1440 WEST 21st PLACE • CHICAGO 8, ILLINOIS

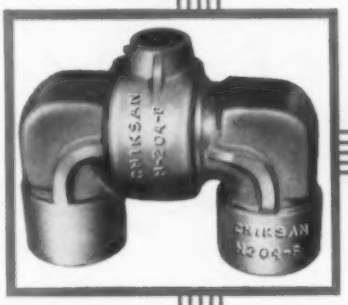
For a

WINNING COMBINATION

WHEREVER YOU USE FLEXIBLE LINES

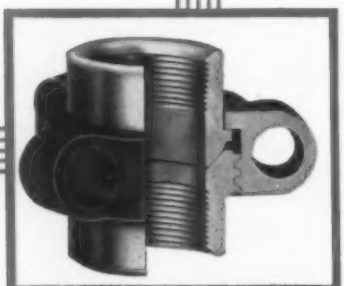
When you fit up swing lines, you want perfect flexibility with low torque, dependable unions and a lubricant that will prevent threads from rusting and freezing. You get all THREE of these advantages with the CHIKSAN-WECO Combination.

CHIKSAN Ball-Bearing Swivel Joints turn on double rows of ball bearings. That means smooth, easy action with low torque. There is nothing to tighten or adjust. That means low maintenance cost. CHIKSAN Packing Units are designed for many different services and pressures. That means dependable service.



CHIKSAN Ball-Bearing SWIVEL JOINTS

WECO WING UNIONS



WECO Wing Unions are made in a wide range of types and sizes for pressures to 12,000 psi. Thoroughly tested and widely accepted by the Petroleum Industry, under the most severe conditions, WECO Wing Unions are now available to users in all lines of industry.

WECO Thread Lubricants provide a perfect seal and complete protection against rust and corrosion. They do not harden under any conditions. Lines are easily set up or dismantled without injury to threads or fittings.

WECO THREAD LUBRICANTS

Representatives in all Principal Cities

WELL EQUIPMENT MFG. CORP. HOUSTON 1, TEXAS
MID-CONTINENT AREA

CHIKSAN EXPORT CO. BREA, CALIFORNIA • NEW YORK 7
EXCLUSIVE EXPORT REPRESENTATIVE

CHIKSAN TRADE MARK
BALL-BEARING SWIVEL JOINTS FOR ALL PURPOSES

CHIKSAN COMPANY
BREA, CALIFORNIA
New York 7 Houston 1

"GOVERNMENT DOCUMENT SERIES" REVISED EDITION NOW ON SALE

A revised edition of the publication, *"Government Document Series,"* is now on sale by the Office of Technical Services, Department of Commerce.

The publication lists alphabetically and enumerates the symbols used in government document series. For example, "AAF APP RR" are the symbols used to describe "Army Air Forces Aviation Psychology Program, Research Reports."

The *Government Document Series* will be of particular interest to research workers, reference librarians and others who work with the numerous Federal government reports and documents, OTS pointed out.

The revised edition, dated November 1947, greatly enlarges the original series list by the addition of all new series established since the first edition was published in January 1947 and gives cross reference material not included in the previous edition.

Mimeographed copies of the revised edition, PB-58101-R (*Government Document Series*, Analyzed by the Office of Technical Services) sell for 25 cents. Orders for the revised edition should be addressed to the Office of Technical Services, Department of Commerce, Washington 25, D. C., and should be accompanied by check or money order, payable to the Treasurer of the United States.

1 1 1

OTS REPORTS NOW AVAILABLE OVER-THE-COUNTER

Business firms and individuals in the Washington, D. C., area and firms maintaining representatives in Washington can now obtain immediate service on their requests for a majority of American and foreign technological reports distributed by the Office of the Technical Services, Department of Commerce, John C. Green, director of the OTS, announces.

Mimeographed and printed OTS reports can be obtained over-the-counter at the special business service sales counter maintained for the convenience of local businessmen and Washington visitors by the Government Printing Office in the lobby of the Commerce Department Building on 14th Street, Northwest.

"Because the OTS stock room is now located in the Commerce Building, any mimeographed or printed OTS report can be obtained while-you-wait," Mr. Green said.

"Reports available in photostat or microfilm form cannot be obtained at the counter," Mr. Green explained, "because usually only one copy exists and several days are required to process reproduction orders at the Library of Congress or other government libraries where the original report is deposited. However, the more popular reports have been mimeographed in quantity in order to provide more rapid distribution of the material in larger demand.

The sales counter carries a stock of the more important current government publications, including the OTS weekly *Bib-*

(*Please turn to page* 260)

OIC

PACE-SETTER IN VALVES

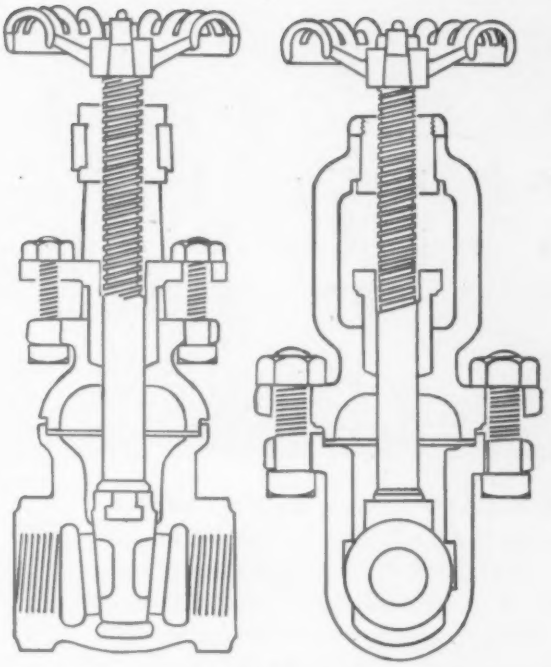
OFFERS A NEW LINE OF Stainless Steel VALVES

THE NEW OIC STAINLESS STEEL VALVE IS AN O. S. & Y., BOLTED BONNET, TAPERED WEDGE GATE VALVE OF SUPERIOR QUALITY

OIC's new Stainless Steel Valve is designed especially for use in the many industries where corrosion is production's enemy number one. As in other OIC Pace-Setting Valves, OIC uses only the finest materials and most modern design.

Material in contact with fluid is 18-8 SMO* Stainless Steel throughout. Bodies, bonnet-yokes and wedges are cast 18-8 SMO (Type 316) Stainless Steel. Stems are from Type 316 rod stock. Yoke bushings through which the stem rises are renewable. The packing is African Blue asbestos material not graphited, which is the best material that can be used against corrosive fluids. Gaskets sealing the round male-female body bonnet joint give utmost safety protection with highest corrosion resistance.

Screwed end sizes available from ½" to 2". Type 304 stainless steel and flanged end available upon request.



*The letter "S" after the numerals designating the chromium and nickel content in OIC Stainless Steel Valves denotes that the carbon content is less than 7/100 of 1%. This is an important factor, as the degree of corrosion-resistance is greatly influenced by the carbon content. Its presence must be limited to the lowest possible percentage. In "S" alloys, this minimum is achieved.

0-548-S

IF YOU WOULD LIKE FURTHER DETAILS ON THIS NEW STAINLESS STEEL VALVE, JUST WRITE, GIVING YOUR NAME, FIRM AND ADDRESS TO THE OHIO INJECTOR COMPANY, WADSWORTH, OHIO.

OIC VALVES

STEEL • IRON • BRONZE

THESE BABBITTED SHIMS, combining babbitt lugs with the adjustable precision thickness of the "solid" LAMINUM shim, allow complete take-up to tolerance. With assurance of seal against oil and pressure loss. No miking, filing or grinding . . . peel with a jackknife.

LAMINUM, the "solid" shims of precision brass or steel laminations that peel for adjustment, are stamped by us to your specifications.

●

Our engineers will send you data and application chart and advise you on the use of babbitted shims.

Laminated Shim Company, Inc., Glenbrook, Conn.

3034

LAMINUM
TRADE MARK

THE SOLID SHIM THAT peels FOR ADJUSTMENT

(*Continued from page* 258)

liography of Scientific and Industrial Reports and the quarterly *Index* to the *Bibliography*.

Mr. Green revealed that businessmen are currently buying OTS reports on German technology and American research at the rate of $1,000 worth a day. The reports are priced at 10 cents to several dollars each. Abstracts of the reports are contained in the weekly *Bibliography* which is available by subscription from the Superintendent of Documents at $10 a year.

THREE BOOKLETS AVAILABLE FROM TUBE TURNS

A new and enlarged edition of the booklet, "Allowable Working Pressures", which is characterized as a time-saving reference source, is available from Tube Turns, Inc., 224 East Broadway, Louisville 1, Ky. The booklet gives allowable working pressures for Tube-Turn welding fittings in five classes of piping. Its subjects deal with piping; gas and air piping (Divn. 1, within plant or city limits, and Divn. 2, cross country piping systems), oil piping within refinery limits, oil piping outside refinery limits, and district heating piping. Also covered are plant process piping and hydraulic machinery piping.

"Stainless Steel Piping — Why and Where to Use it", available without cost, deals authoritatively with its subject and makes a welcome addition to the reference library.

A third issue is a 20-page supplement to the Tube-Turn Catalog and Engineering Data Book No. 111, on welding fittings and flanges for industrial piping. The supplement is devoted to specifications that cover new items. It is 6″ x 9″ and slips into the pocket on the inside back cover of the catalog.

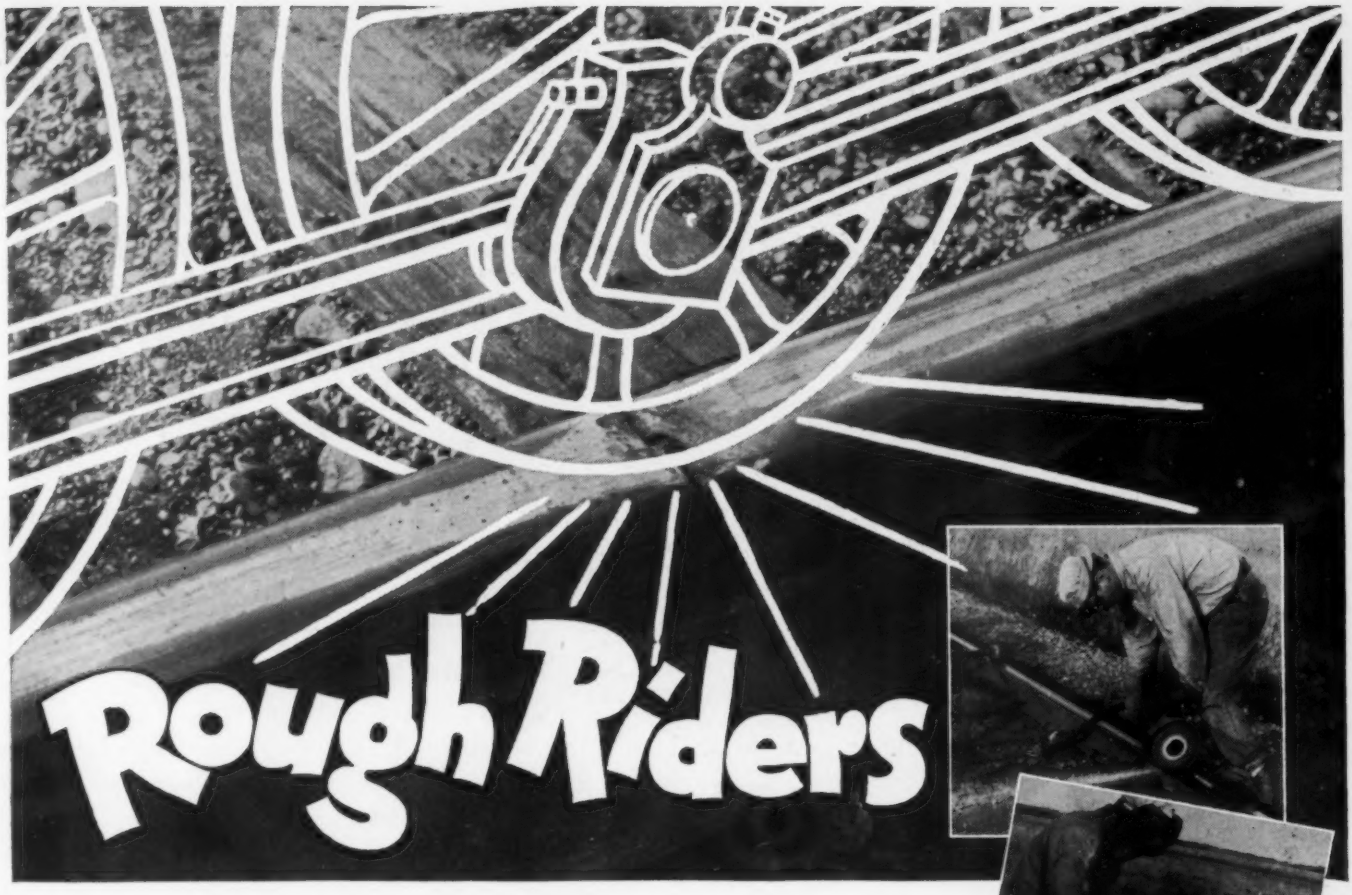
ALUMINUM PRODUCTION IN COLOR IN "PIGS & PROGRESS"

Color motion picture showing the production of aluminum from bauxite to finished products, titled "Pigs and Progress", has just been released by the Reynolds Metal Company. The 16-mm. picture, produced by Reynolds own motion picture department is in sound and full color. It is available with sound track, without charge. Further information about its use may be had from the Advertising Department of the Reynolds Metals Co., 2000 South Ninth Street, Louisville 1, Ky.

RUBBER PRINTING MATERIALS

"A Primer on Rubber for the Printer", 14 pages, illustrated catalog, is available from the Printer's Supplies Department, Mechanical Goods Division, Goodyear Tire & Rubber Co., Akron, Ohio. The booklet tells about the advantages offered by rubber printing materials, and describes the company's products in this field,—rubber plates, engraving, unvulcanized and stamp gums, special fabrics and rubber cements.

(*Please turn to page* 264)



cured with Amsco Railface . . .

"Rough Riders"—that's an heroic term, in history books, but not when it's applied to the rails over which the passenger and freight trains roll across the country. Such worn and battered rail ends as are shown above can only mean passenger discomfort and unnecessary wear and tear on equipment. Amsco Railface electrodes are giving phenomenal results in keeping rail joints smooth for rider satisfaction and reduced equipment maintenance costs.

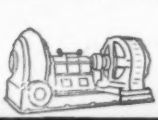
The small photographs show how the spalled or battered sections are ground, the welding operation, the joint after welding, and the completed weld after grinding ends to conform to balance of rail section. With an as-deposited Brinell of 325 to 350, work-hardening to 380 Brinell, this specialized electrode for high carbon content rail assures smooth joints that STAY SMOOTH.

This is another in the long line of Amsco Conservation Welding products that effect savings daily by reclaiming rebuilding, repairing, or hard-facing of parts subject to wear and service abuse. Complete details of all products are available in Bulletin 1047-W.

AMERICAN Brake Shoe COMPANY

AMERICAN MANGANESE STEEL DIVISION
CHICAGO HEIGHTS, ILL.

Foundries at Chicago Heights, Ill., New Castle, Del., Denver, Colo., Oakland, Calif., Los Angeles, Calif., St. Louis, Mo.
Offices in principal cities. Made and sold in Canada by Canadian Ramapo Iron Works, Inc., Niagara Falls, Ont.



MANGANESE STEEL CASTINGS
"CHROME-MOLY" STEEL CASTINGS
HARDFACING ELECTRODES
GRINDING MILL PARTS

DIPPERS DREDGE PUMPS CRUSHER PARTS CHAINS SOLIDS PUMPS BUCKETS WHEELS

In Four Great Industrial Areas... RB&W Makes Strong the Things That Make America Strong

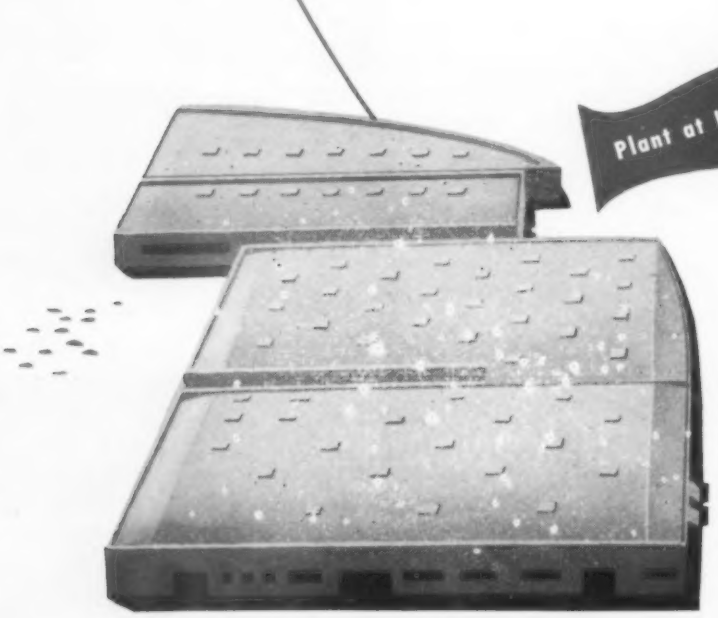
This is America at its best . . . resourceful and enterprising.

103 years ago, a tiny factory in the small New England town of Pemberwick, Connecticut.

Today—four great fastener manufacturing plants, each at the heart of a major industrial area . . . representing investments of many millions of dollars in plants and equipment . . . producing more than 6,000,000,000 fasteners per year.

Tomorrow—an even deeper integration into the structure of American industry. Equipped with the fastener industry's finest facilities—both in a geographical and technological sense—RB&W's current commitments call for $3,500,000 for improved facilities, plant expansion, research and development.

Wherever American industry moves forward, RB&W will be a vigorous part of it, helping it to meet whatever challenge it may face . . . with products and services that match the highest standards of our customers.



Pictured are the four RB&W plants—at Los Angeles (Cal.), Rock Falls (Ill.), Coraopolis (Pa.), and Port Chester (N. Y.)—*providing the broadest geographical coverage of any bolt and nut manufacturer.*

RUSSELL, BURDSALL & WARD BOLT AND NUT COMPANY

Plant at Port Chester, N. Y.
Plant at Coraopolis, Pa.
Plant at Rock Falls, Ill.
BOLTS · NUTS · SCREWS · RIVETS
RB&W
THE COMPLETE QUALITY LINE
& ALLIED FASTENING PRODUCTS

RB&W bolts, nuts, screws, rivets and allied fastening products manufactured in a broad range of styles, sizes and finishes. Plants at: Port Chester, N. Y., Coraopolis, Pa., Rock Falls, Ill., Los Angeles, Calif. Additional sales offices at: Philadelphia, Detroit, Chicago, Chattanooga, Oakland, Portland, Seattle. Distributors from coast to coast.

103 YEARS MAKING STRONG THE THINGS THAT MAKE AMERICA STRONG

MEET PRODUCTION SCHEDULES

...Use ThredKut * on your Toughest Machining Jobs

*THREDKUT, a versatile, heavy-duty cutting oil, is famous for its top performance on jobs found to be too tough for other oils. Due to the stabilized balance between its uniformly high anti-weld value and its other desirable cutting characteristics, it is especially efficient in the machining of tough, stringy metals and for the more difficult operations, such as thread cutting, tapping, broaching and gear shaping.

As supplied, THREDKUT is scientifically correct for the severest metal-working conditions. For less severe conditions, it can be diluted with from 4 to 20 parts of low-cost blending oil. Properly applied, it will out-perform competitive cutting fluids on 3 out of 4 machine operations.

For details and literature on THREDKUT and other Stuart cutting fluids, write today.

STUART *oil engineering goes with every barrel*

D.A. Stuart Oil CO. LIMITED

2727-31 S. TROY STREET, CHICAGO 23, ILL.

STANDARD TERMINOLOGY FOR STEEL FASTENER INDUSTRY

Standardization of terminology and abbreviation for designating bolts, nuts, screws, rivets and other related products in the fastener industry is advocated in a recent compilation published in *"Fasteners"*, the official publication of the American Institute of Bolt, Nut and Rivet Manufacturers, Cleveland, Ohio.

A four-page brochure, reprinted from "Fasteners", Volume 4, No. 2, gives recommended abbreviations for the various types of fasteners and points out that both producers, and buyers of threaded products will benefit through the adoption of a standard system of terminology and abbreviations for use on drawings, orders, invoices, stock lists and other records. This standardized version of terminology compiled jointly by producers should render the task of both manufacturer and user infinitely easier in all phases of correspondence.

One manufacturer found that use of his own individual system of fastener abbreviation and terminology resulted in three times the normal output of the company's order department.

All in all, producers feel that a common set of abbreviations and standard phraseology throughout the industry will bring about an enormous saving in time and money by facilitating readily understandable records and expediting ordering, shipping and billing operations.

FUTURE OF CORDAGE INDUSTRY MAY DEPEND UPON SYNTHETICS

Will man-made fibers such as nylon and rayon ever replace the natural abaca, sisal or henequen now required for the production of heavy cordage and rope?

"No one is more interested in synthetics than the cordage manufacturers in the United States," said Dr. E. B. Johnson, Director of Research Laboratories of the Columbian Rope Company. "Faced with a shortage of hard fibers as a result of war-time destruction, the cordage industry may find a solution to the problem in these man-devised substitutes."

No one can speak for the future, he added, for at this time, with research moving in all directions, the ultimate uses of these man-made fibers are still unknown.

Discussing the history of synthetic fibers, Dr. Johnson said that rayon development at the end of the Nineteenth Century produced a weak fiber which found few commercial uses. Improvements followed swiftly, however, and today it is a strong, inexpensive fiber with wide applications. Germany, Italy and Japan developed staple rayon fiber, and France, Holland and Belgium fostered rayon production prior to World War II.

Rayon is actually a semi-synthetic made from cellulose which is derived from cotton linters and wood pulp. These basic materials have limited rayon's uses, but its development stimulated further re-

(*Please turn to page* 266)

Thousands of Jelliff baskets of all sizes, give unusual service under a wide variety of conditions. Jelliff baskets are designed and engineered to provide maximum performance and economy on the job. Special types can be produced to specifications in the Jelliff plant with its complete facilities for drawing, weaving and fabricating. Available in aluminum, brass, copper, monel, steel, stainless nickel and other metals and alloys.

Write DEPT. 208 For Literature

DIPPING BASKETS • LEKTROMESH • RESISTANCE WIRE
WIRE MESH PARTS • WIRE CLOTH • STRAINERS • FILTERS
The C. O. JELLIFF MANUFACTURING CORPORATION
SOUTHPORT, CONN.
WIRE PRODUCTS SINCE 1860
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THE LOW COST PACKAGE with the *Luxury Look*

Food in Deltaseal Bags stays pure. For this rich-looking, modern package protects against sifting and contamination . . . guards the quality of your foods right into the home. Because all of the sides are flat, Deltaseal Bags stack compactly . . . no wasted space in storage or transit. Furthermore, with your brand printed in a colorful, eye-catching design, Deltaseal Bags make attractive, sales-building displays.

Ask your Bemis representative about the economy of Deltaseal Bags and the Deltaseal Packaging System.

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BEMIS *Deltaseal* BAGS

Available in 5-lb., 10-lb. and 25-lb. sizes. Also in smaller sizes down to 2 lbs.

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NATION-WIDE BAG SERVICE

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● One Hundred Years is a mighty long time. It also can be a rather uneventful span . . . nothing of much importance is recorded between 847 and 947 A. D. It can also be a century of great events and progress—1847-1947, for example. And this is the period of our experience in manufacturing bags of all kinds for American industry and agriculture.

This experience is a very important part of the background that your technically trained Chase Salesman brings to bear on your packing problems. Whatever your packing needs may be, Chase can provide an efficient and economical container for your products. It will pay you to check with your nearby Chase Salesman.

Chase factories and sales offices are strategically located to quickly serve your specific requirements.

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NEW ORLEANS • ORLANDO, FLA • SALT LAKE CITY • OKLAHOMA
CITY • PORTLAND, ORE. • REIDSVILLE, N. C. • HARLINGEN, TEXAS
CHAGRIN FALLS, O. • HUTCHINSON, KAN. • CROSSETT, ARK.

(*Continued from page* 264)

search toward evolving new fibers which would meet commercial needs.

What industrial cordage possibilities may reside in nylon—the "miracle fiber"—only the future can tell. Made from coal, air and water, it is already reshaping the future of the cordage and textile industries. Nylon has been used in the manufacture of rope for use on ships and by the aircraft industry. It is stronger than abaca fiber; is durable, flexible, resists water, and stretches without weakening its tensile strength.

"It has proved its worth as cordage," Dr. Johnson declared, "and its strength, elasticity, and abrasion resistance have made it eminently successful in a commercial sense."

A deterrent to the wide use of nylon in cordage production is the fact that in the United States there is only one producer of nylon at present. Although licensing arrangements to permit other producers to enter the field have been discussed, indications are that the situation will not change in the immediate future.

Chemical experiments with polyvinyl resins have resulted in two types of thermoplastic fibers, "Vinyon" and "Saran" or "Geon." "Vinyon" is the trade name for a resin produced by the copolymerization of vinyl chloride and vinyl acetate, and "Saran" is a copolymer of vinyl chloride and vinylidene chloride. Vinyl chloride is available in coke, lime, water and salt; the vinylidene chloride comes from ethylene, a petroleum by-product found in coke, natural gas, and industrial alcohol. Both "Vinyon" and "Saran" went into commercial production in the United States before the war but expansion of industrial use was halted because of the military requirements for the basic polyvinyl resins. Current production of the two fibers amounts to about 2,700 tons a year but is expected to increase in the near future.

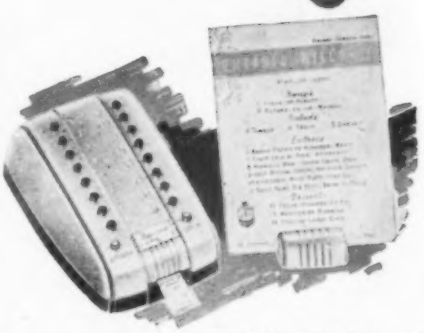
"These developments indicate that important changes are taking place in the fiber industry," Dr. Johnson stated. "How Vinyon and Saran may be utilized ultimately in cordage is as yet a riddle. No answer is at hand. But when one thinks of what has occurred in the case of nylon, the sensible thing to do is to watch the chemists and to listen attentively when they come up with newer developments."

G. E. ANNOUNCES LINE OF PHENOLIC MOLDING POWDERS

The General Electric Chemical Department, Pittsfield, Mass., makes announcement of a complete line of phenolic molding powders, which includes general purpose, high heat resistant, and impact resistant plastic materials, available in standard colors and mottles. The company said the molding materials provide excellent finishes and high glosses and are available in a flow range of soft, medium-soft, medium hard, and hard.

(*Please turn to page* 268)

ELECTRONIC WAITRESS... FOR RESTAURANTS IN 1950 ?



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WHEN, and if, restaurants mechanize their order-taking with a push button unit connected to their kitchen, our Auburn engineers will help determine whether it is a job for plastics. If it is, Auburn's unlimited facilities will guarantee that it is molded of the right plastic . . . by the most efficient molding method.

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Whenever you have a problem in plastics, write or call: Auburn Button Works, 300 McMaster St., Auburn, N. Y.

COMPRESSION, TRANSFER AND INJECTION MOLDING • AUTOMATIC ROTARY MOLDING FOR MASS PRODUCTION • EXTRUDED VINYL OR ACETATE TUBES AND SHAPES • MOLD ENGINEERING AND COMPLETE MOLD SHOP.

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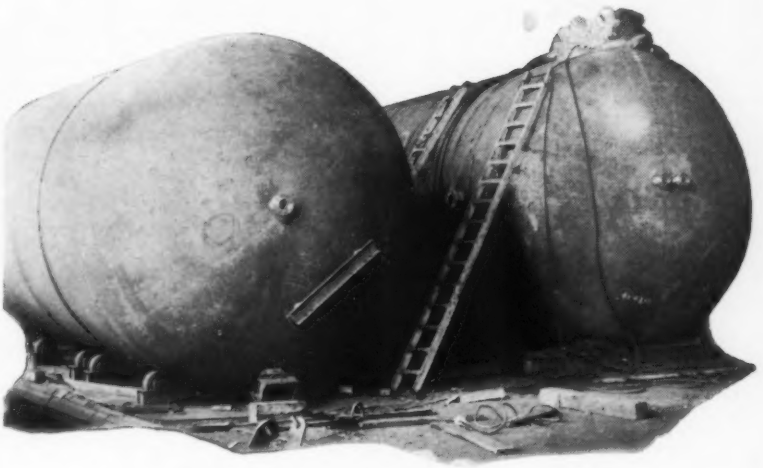
Offices: New York and Chicago, *Representatives:* New England, Philadelphia, Cleveland, Detroit, San Francisco

Size Is No Obstacle!



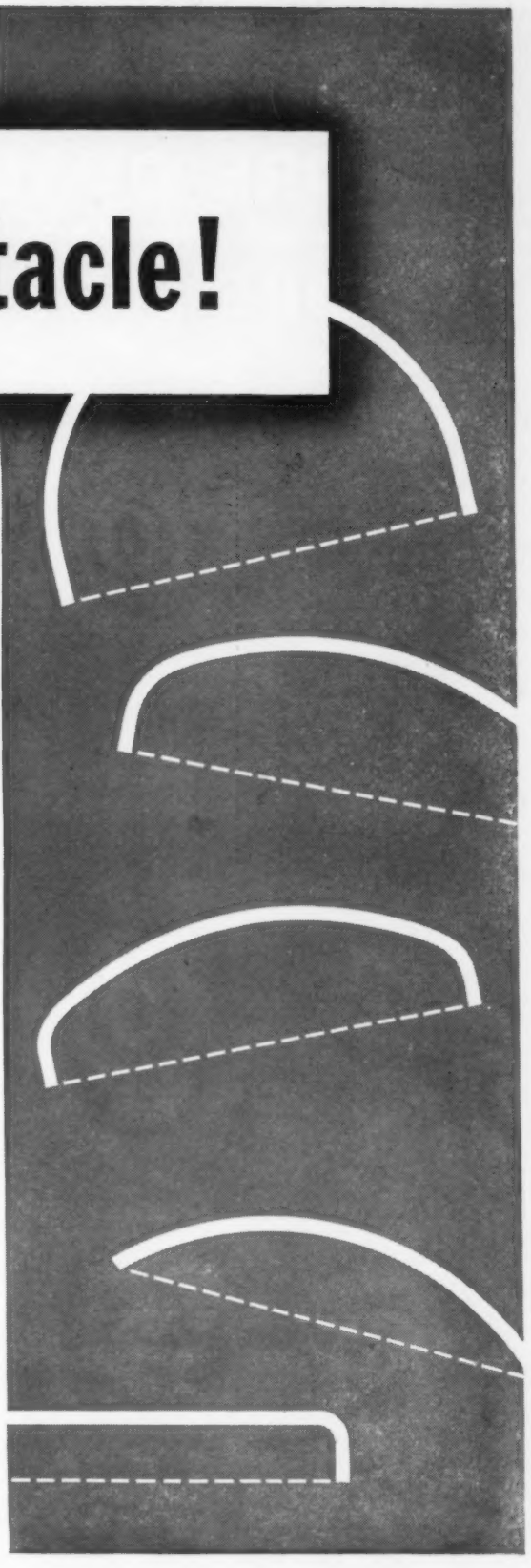
Lukens Flanged and Dished Heads, 13'-0 7/8" O. D., 1 3/8" thick, formed of Lukens Stainless-Clad Steel, were used by the fabricator of these large vessels.

From the smallest head size to the largest, light gage or heavy gage, Lukens can supply the widest range of head styles and sizes obtainable from any single source in the country. In any commercial metal, too—carbon and alloy steels, nonferrous metals, clad steels.

Many sizes of Standard and ASME Flanged and Dished Heads are in stock, ready for immediate shipment. For other sizes and styles, hundreds of dies are available, ready to be put to use for you.

Fitting-up time is held to a minimum with Lukens Heads. They're shaped according to exacting specifications and accurately dimensioned.

Write on your company letterhead for Catalog No. 1 giving complete data on 3868 Lukens Heads and for Bulletin 433 on stock Heads. Lukens Steel Company, 415 Lukens Building, Coatesville, Pa.



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- *Full Range of Sizes from ⅛ inch through 4 inches*
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- *Carbon, Stainless and Alloy Steels*

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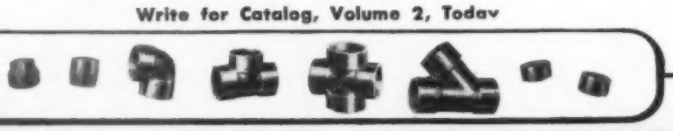

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STOCKED AND SOLD BY LADISH DISTRIBUTORS IN PRINCIPAL CENTERS

NEW WATER DISPERSION PAINT YIELDS HARD FILM IN HALF-HOUR

A new paint, made from a water dispersion of a synthetic resin instead of customary drying oils, dries in less than half an hour without odor, yet possesses the durability and finish of high class oil paints, according to a joint announcement made by Cyril S. Kimball, vice president of the New York chemical consulting firm of Foster D. Snell, Inc., and George O. Morrison, Technical Director of Shawninigan Products Corporation, resin manufacturers, New York.

The vehicle of the new paint is a dispersion of totally synthetic poly-vinyl resin in water and is expected, the announcement said, to help free the paint industry from dependence on natural oils and resins. The new product is designated by the trade-mark "Gelva" paint.

The pigment and poly-vinyl resin are dispersed in water with one per cent or so of a synthetic wetting agent. The product can be brushed or sprayed on in the same manner as an ordinary paint. The applied paint dries in less than half an hour to yield a hard film.

When dry, the painted surface can be washed and scrubbed without harm, just as an oil paint can be, and is stable to air oxidation, but its speedy drying and freedom from odor are valuable advantages especially for interior use.

The advantages claimed for "Gelva" paint, are:

1. Freedom from odor;
2. Reduced fire hazard;
3. Freedom from toxic eects;
4. Economy;
5. Rapid Drying;
6. Improved durability;
7. Enhanced stability of colors; and
8. Easy application by brush or spray gun.

Revolutionary New Paint

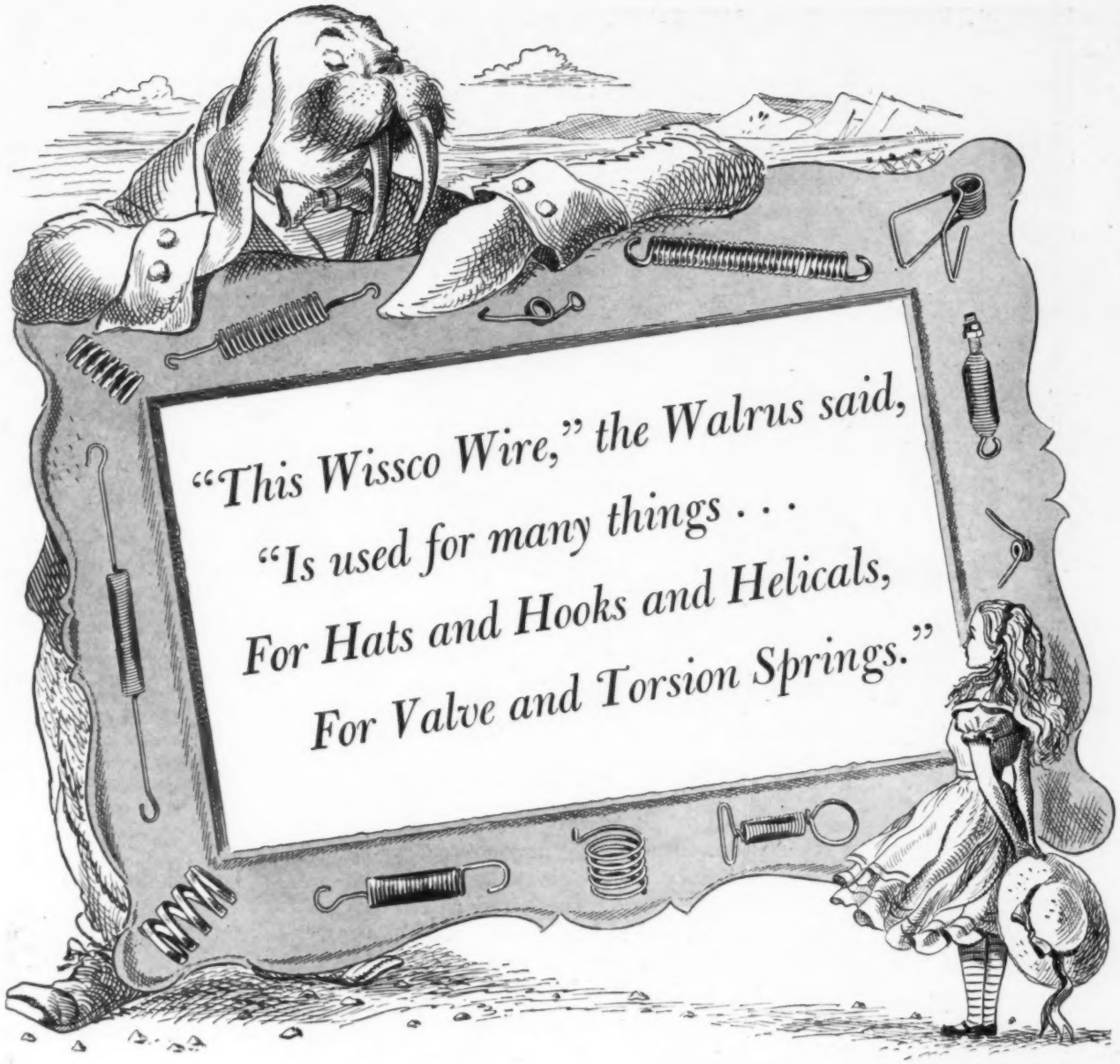
Although "Gelva" paint possesses special advantages for indoor use, its value is by no means confined to interiors. Outdoor exposure tests show excellent weathering qualities.

"Gelva" paint can be applied to the natural surfaces of wood, metal, brick, plaster, and wallboard, or to surfaces previously coated with oil paint. It has been made in a full range of colors and tints from dense black through the usual range of deep colors and pastel tints to pure white.

The vehicle of "Gelva" paint is completely synthetic, being derived solely from coal, lime and water. Its use will therefore free the paint industry from dependence on natural drying oils of vegetable and marine origin, which are not always uniform in quality.

It is planned that commercial production and marketing of the new "Gelva" paint will be handled by established paint manufacturers. The Shawinigan companies plan to supply the new vehicles to paint manufacturers.

CLASSIFIED SECTION PAGE 334



BECAUSE of its fine quality, Wissco Oil Tempered Wire is becoming the first choice of more and more manufacturers whose products require this type of wire.

Wissco Oil Tempered Wire is characterized by its uniformly high tensile strength, torsional value and fatigue life. It is supplied in a size range of from .010 to 9/16" in coils, diameters ranging from 8" to 6' and in cut lengths.

For this and scores of other steel specialty wires, call Wickwire Spencer. We can meet your needs for high or low carbon steel wire; round or shaped; in a wide variety of sizes, tempers, grades and finishes. And, if you have a wire problem, our metallurgists will be happy to help develop the type of wire that best meets your requirements. Send your wire questions to Wickwire Spencer.

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A PRODUCT OF WICKWIRE SPENCER STEEL DIVISION · THE COLORADO FUEL AND IRON CORPORATION

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CF&I

Why "Drinking Men" are the best workers

YOUR WORKERS' efficiency may drop off sharply if they do not drink as much water as they lose through perspiration. In bringing out this fact, recent scientific studies* also state "during work, men never voluntarily drink as much water as they sweat."

That's why it's good business to encourage drinking with plenty of General Electric Water Coolers in easy-to-get-at places around your plant. These G-E Coolers provide clean, cool water at an operating cost of only a few cents a day.

G-E Water Coolers are available in the convenient foot pedal bubbler-type and also the bottle-type for use where water supply is limited.

Make certain every one of your workers is getting all the water he needs for top efficiency. Call your General Electric Dealer today. *General Electric Company, Air Conditioning Department, Section W8293, Bloomfield, N. J.*

*American Journal of Physiology
Vol. 142, No. 2

GENERAL ELECTRIC
Water Coolers

USE FIBRE DRUMS FOR FOOD EXPORTS CONTRIBUTIONS

The accompanying illustration shows foodstuffs repacked in large fibre drums, for export to Europe under the United Nations Children Relief Program and the Friendship Train Contributions. The drums have a capacity of 41 gallons or 5.48 cubic feet. The drums are made in two diameters to permit nesting of the empty containers until used—one size being 20″ diameter and 30″ deep, and the other 21½″ diameter and 26″ deep. A water vapor barrier is incorporated in the fibre board, and the insertion of a separate bag liner is not usually necessay at time of packing.

Drums are filled with elbow macaroni. Sheet of pliofilm is spread over top to protect contents before cover is put in place.

Thousands of tons of powdered milk and powdered eggs are shipped in fibre drums both for domestic and export trade. For these commodities a light weight bag liner is used as an extra safeguard against loss of product if drums are damaged incident to handling. The standard bulk containers, made according to specifications approved by the U. S. Department of Agriculture, are adequate for ocean transportation, and repacking is unnecessary.

NEW TYPE RUBBER ANNOUNCED BY GOODRICH CHEMICAL CO.

A new type American rubber that can be compounded and vulcanized in a wide range of soft to hard compositions is announced by J. R. Hoover, vice-president sales, B. F. Goodrich Chemical Company, Cleveland, Ohio. The new product, to be known as "Hycar P.A.," is technically identified as a polyacrylic ester and is an elastomeric material resembling natural, pale crepe rubber in appearance. The vulcanized forms exhibit outstanding resistance to heat, oils, ultraviolet light, ozone and gas diffusion, and non-rigid compounds show extremely good flexing life. Compounding, molding, extruding, calendering and curing operations are readily accomplished with standard rubber processing equipment.

Available in both dry and latex forms, Hycar P.A. in the unvulcanized state is expected to find many applications as an adhesive and as a coating or impregnant for fabrics and papers. Vulcanized prod-

(*Please turn to page 272*)

CHOOSE FROM 20,000
SHAPES AND SIZES IN THE

REPUBLIC UPSON

full line!

. . . and cash in on the economies of buying from one dependable source of supply. Republic Upson headed and threaded products go together easily, stand up in heavy service and meet exacting requirements every time. Your choice always is right when it's Republic Upson — backed by almost a century of manufacturing skill and experience.

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REPUBLIC *Upson Quality* BOLTS AND NUTS

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Other Republic Products include Pipe, Sheets, Tubing, Hot Rolled and Cold Drawn Bars—Carbon, Alloy and Enduro Stainless Steels

TOUREK BALL JOINTS

the recognized standard!

Years of experience in filling the needs of industry has enabled Tourek to develop a line of stock types and sizes of ball joints that meets virtually all requirements.

In those instances where special types are necessary, Tourek engineers and designers provide manufacturers with an invaluable source of expert assistance.

Tourek can supply your most exacting requirements for ball joints. Illustrated catalog showing stock types will be sent on request. Requests for information on special types will receive prompt attention.

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TOUREK
FAMOUS BALL JOINTS

more than 80 Oakite Materials to solve your cleaning problems

THERE'S NO PRICE TAG on the most valuable thing we have to offer. If the Oakite Technical Service Representative has helped you solve a cleaning problem, you know we're talking about *Oakite Service.*

This intangible is the practical in-plant application of carefully compounded materials and job-tested methods for all types of cleaning. It is a service that will show you how the chemistry of cleaning can save you time and effort . . . help make your products better.

So, if cleaning, descaling, degreasing, machining, rust-proofing or deodorizing are a part of your production picture, call in Oakite Service. The address is Oakite Products, Inc., 54 Thames St., New York 6, N. Y. No obligation.

OAKITE
REG. U. S. PAT. OFF.
MATERIALS
METHODS
SERVICE

Specialized Industrial Cleaning

Technical Service Representatives in Principal Cities of U. S. & Canada

(*Continued from page* 270)

ucts have shown outstanding performance as heat-resistant coatings on fabrics, heat and oil-resistant gaskets, hose, belting, oil seals and other mechanical applications. As an insulation coating on electric motor coils, and as a heat and oil-resistant jacket for wire, polyacrylic ester shows promise of extending the usefulness of electrical products.

Hycar P.A., now in semi-works production, was developed after many years of experimental work by the company's research laboratories on flexible compounds for high temperature service. Patents coveing processes of vulcanization have been issued to the company and will be made available to licensees. These processes make possible the manufacture of rubber products that will withstand operating temperatures considerably above those of conventional rubbers. When tested under an electric iron at 400° F. for 8 hours, the new material showed no apparent loss in properties, whereas older type rubber compounds were completely deteriorated in a much shorter time. After 720 hours at 300° F., the polyacrylic ester shows a change in elongation of only 35 per cent in comparison with 75 per cent in 7 hours for good rubber compounds. Ozone resistance is even more striking, 600 hours exposure showing less effect on the new material than 6 seconds exposure on rubber.

CARBOLOY DRILLS SPEED THROUGH GRANITE ROCK

Ten holes each over 2 feet deep were bored in 15 minutes.

Some of the newest uses for Carboloy cemented carbide were demonstrated to over 2,000 employees of Carboloy Company, Inc., and their families—at the Company's annual "open house". Since there were no mines handy, the company imported a big block of granite to show how Ingersoll-Rand power drilling equipment is now being used with Carboloy tipped drills to drill more holes and drill them faster in mining operations. P. W. (Bud) Weiser, carboloy development engineer, is doing the demonstrating. It took him only 15 minutes to drill 10 holes each over 2 feet deep. Apparently the drill was then still good for another 100 holes before getting dull.

FOR A LITTLE AT A TIME

...OR ALL AT ONCE

See Chase for Brass or Copper

BRASS rod by the carload . . . or a few lengths. Copper nails by the ton . . . or by the keg. Big order or little . . . they both get the kind of service that has made Chase "the nation's headquarters for Brass and Copper."

To set the big Chase network in action, send an order to your local Chase warehouse. If it's a large order it's passed on to a Chase mill and the Chase warehouse may send you a "tide-over" supply to keep your production lines moving.

Call your local Chase warehouse for service that is tops in the nation for brass and copper.

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Chase

the Nation's Headquarters for
BRASS & COPPER

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THIS IS THE CHASE NETWORK . . . *handiest way to buy brass*

ALBANY† ATLANTA BALTIMORE BOSTON CHICAGO CINCINNATI CLEVELAND DETROIT HOUSTON† INDIANAPOLIS KANSAS CITY, MO. LOS ANGELES MILWAUKEE MINNEAPOLIS NEWARK NEW ORLEANS NEW YORK PHILADELPHIA PITTSBURGH PROVIDENCE ROCHESTER† SAN FRANCISCO SEATTLE ST. LOUIS WASHINGTON† WATERBURY (†Indicates Sales Office Only)

PERSONALITIES in the NEWS

Seth S. Wiley has been appointed Purchasing Agent of the Lyon-Raymond Corporation, Greene, N. Y. Mr. Wiley joined the company last year, after having been two

Seth S. Wiley

years with Century Metal-Craft Corp. as a distributor. Previously he had been with the War Production Board, Washington, D. C., from 1942 to 1945, was industrial specialist, automotive division, engine branch. During 1941-42 he was a tool expeditor for Joshua Hendy Iron Works, Sunnyvale, Calif.

George E. Burley has been appointed Director of Purchases of the Lustron Corporation, Columbus, O., according to an an-

George E. Burley

nouncement by Carl G. Strandlund, president. Mr. Burley, who has been with the Budd Company in Detroit since 1928, has resigned as Assistant Director of Purchases for that firm to take up his new duties.

Roland E. Harris has been appointed Director of the Central Follow-Up Department in the Purchasing Division of the Ford Motor Company, Dearborn, Mich., according to an announcement by A. J. Browning, Vice-President and Director of Purchasing.

Mr. Harris comes to Ford from the Plymouth Division of the Chrysler Corporation where he served as Superintendent of Planning and Scheduling. At Ford, he will be responsible for the overall direction of all distribution and follow-up of purchased parts and materials to assembly plants and manufacturing plants and for the coordination and planning of the flow of these materials.

Mr. Harris began his career in purchasing at the old Maxwell Company in 1917. Since then he has served with Chevrolet Division of General Motors, Dodge and DeSoto, before joining Plymouth.

Richard J. Joyce has been appointed Purchasing Agent for Link-Belt Company's Indianapolis, Ind. plants, replacing Frank

Richard J. Joyce

C. Thompson who has retired after holding the position since 1919.

Mr. Thompson entered the employ of the company's Pershing Road, Chicago, plant in 1906 and successively had charge of stores material at both this plant and Indianapolis, prior to becoming Purchasing Agent. He held the post of vice-president of the Indianapolis Association of Purchasing Agents several times.

Mr. Joyce began working for Link-Belt in the foundry office at Indianapolis in 1917. He was employed in the purchasing department, in sales, stores and material handling from 1919 to May, 1947, and had been Assistant Purchasing Agent since that time.

J. C. Kirk has been named General Purchasing Agent of the Chicago, Rock Island & Pacific Railroad Co., with headquarters in Chicago, Ill., to succeed W. R. Owen, who is retiring.

Clarence M. Strong has been named Director of Purchases of F. L. Jacobs Co., Detroit, Mich., according to an announcement by Rex C. Jacobs, president. In this newly

Clarence M. Strong

created position, Mr. Strong will be in charge of purchasing for all plants of the company and its subsidiaries.

Mr. Strong comes to the Jacobs company from Plymouth Steel Co., where he was general manager. Prior to this, he was with Ford Motor Co. for 28 years in various purchasing capacities.

G. W. Munger has been elected Vice-President in charge of Purchasing of the Hudson Motor Car Co., Detroit, Mich.,

G. W. Munger

to succeed Charles A. Oostdyk, who has resigned to take an extended rest.

Mr. Oostdyk's retirement came after 41 years in the automobile industry, nearly 40 of which had been spent in purchasing. He entered the automobile business in 1907 and served in various production and purchasing posts before joining Hudson in 1918 as Purchasing Agent. In 1932 he was elected Vice-President in charge of Purchasing and a member of the board of directors.

(*Please turn to page* 276)

DIES WITH LONGER LIFE

New Sunicut with Petrofac* Eliminates Frequent Regrinding of Tools in Radio Parts Plant

A manufacturer of radio parts recently tripled the life of threading dies by changing to one of the new Sunicut cutting oils made with Petrofac—an all-petroleum compound that contains no animal or vegetable fatty oils, and will not turn rancid. Before he changed to Sunicut, the threading dies could be used only 10 hours without regrinding, but now they are used for 30 hours.

The smoother, more economical manufacturing that resulted is typical of the benefits obtained in hundreds of plants where Sun "Job Proved" products are at work. For example, a tire company eliminated an entire manufacturing step by using a Sun Rubber Processing Aid. A paper mill, by switching to an adhesive Sun grease, saved approximately $2,900 a year in labor and cleaning costs. A steel mill saved $4,416 a year on the cost of lubricants after changing to Sun.

For complete information on how Sun "Job Proved" products can help you effect similar savings, write the nearest Sun office, or Department PU-3.

SUN OIL COMPANY • *Philadelphia 3, Pa.*
In Canada: Sun Oil Company, Ltd.
Toronto and Montreal

*Petrofac is a trade-mark of Sun Oil Company

SUN PETROLEUM PRODUCTS
"JOB PROVED" IN INDUSTRY

SUNOCO

(*Continued from page 274*)

Mr. Munger, who as Purchasing Agent has served as head of Hudson's buying operation under Mr. Oostdyk for many years, is a veteran of 35 years in the automobile business. He joined Hudson as a buyer in 1919 and has been with the company continuously ever since that time. He was Assistant Purchasing Agent from 1924 to 1932 and from 1932 on was Purchasing Agent.

E. W. Romer has been appointed General Purchasing Agent of Montgomery Ward, Chicago, Ill. He has been with Wards for

E. W. Romer

22 years, serving in many departments of the business. His most recent position, which he held for 12 years prior to the new appointment, was retail advertising production manager for Wards 629 stores.

Leo J. Schulte has been appointed Purchasing Agent of the Mosebach Electrical & Supply Company, Pittsburgh, Pa., succeeding S. E. Kane, who has been named superintendent of production. Mr. Schulte was formerly Assistant Purchasing Agent.

Russell G. Ford, who has been with Chevrolet for 26 years, has been appointed General Purchasing Agent for the Chevrolet Corp., Detroit, Mich., with authority

Russell G. Ford

to formulate procurement policies for the division. G. M. Haley has been promoted from Assistant Purchasing Agent to Purchasing Agent of the central office; E. J. Furbacher has been promoted from senior buyer to Assistant Purchasing Agent of the central office.

Mr. Ford joined the Chevrolet plant and production engineering department in 1922. He was appointed buyer in 1928, Purchasing Agent of the Indianapolis plant in 1930, and General Purchasing Agent of the central office in 1940. In his new capacity he will direct procurement policy for the entire division, coordinate buying and material control of all plants, and direct central office purchasing and material control. Mr. Ford's office will be the clearing house for all contracts concerning procurement.

Mr. Haley joined Chevrolet in 1923 as a stenographic clerk, was made buyer later that year and Assistant General Purchasing Agent in 1945. Mr. Furbacher began work with Chevrolet as a clerk in 1929, and became a buyer in 1942.

J. H. Lambrix has been appointed Assistant Director of Purchases of The Electric Auto-Lite Company, Toledo, O., according to an announcement by E. H. Reed, Director of Purchases. Mr. Lambrix has been with Auto-Lite for 23 years, joining the engineering department of the battery division in 1925 at Niagara Falls, N. Y. He joined the purchasing department four years later. He was transferred to Toledo in 1942.

Charles L. Long has been appointed Purchasing Agent for Clayton Mark & Company, Evanston, Ill., succeeding Charles E. Gruner.

C. E. Gruner

C. L. Long

Mr. Gruner retired recently after twenty years' service with the company as Purchasing Agent. When he joined the company in 1927 he had had almost 30 years' experience in purchasing and for the four previous years had been Purchasing Agent of the National Malleable Steel Castings Company Cicero, Ill. plant.

Mr. Long has been with the company since 1928. In 1938 he was put in charge of the credit department, which position he held until the outbreak of World War II, when he was transferred to the Purchasing Department in charge of priorities and expediting of critical materials. After two years in Naval Supply, he returned to the company to assist Mr. Gruner. Later that year he was appointed a buyer.

Kenneth V. Coombes has been named Purchasing Agent for the Brown Company, Berlin, New Hampshire, following the retirement of Thomas W. Estabrook. Mr. Estabrook, who had held the post since 1939, organized the first central purchasing system of the company in 1914.

Mr. Coombes came to the company from the General Chemical Division of the Allied Chemical & Dye Corporation, where he had been Manager of Purchasing since 1940. From 1928 to 1940 he was Purchasing Agent for the Canadian Copper Refiners Ltd., of Canada.

Thomas W. Harris, Jr. has been named Director of Purchases of E. I. du Pont de Nemours & Co., Wilmington, Del., to succeed Ernest H. Hawkins who retired on February 1.

As head of the company's Purchasing Department, Mr. Hawkins was responsible for the expenditure of millions of dollars annually for raw materials, fuel, power, equipment and supplies. He joined the company in 1917.

He was graduated from Syracuse University in 1907, receiving his mechanical engineering degree. Prior to entering the Du Pont Company, he worked for the

E. H. Hawkins

Allis Chalmers Manufacturing Company in Milwaukee, Wis., and was engaged in sales engineering projects in New York and Philadelphia from 1913 to 1917.

After coming to Du Pont he was, successively, a buyer in the Purchasing Department and Division Purchasing Agent for the Equipment, Chemical and New York divisions. He was made Purchasing Agent of the company in 1930, continuing until 1945 when he was appointed Director of Purchases.

From Syracuse University in 1945 Mr. Hawkins received the George Arents Medal for excellence in commerce and industry. He is co-editor of the "Handbook of Purchasing Policies and Procedure." He was president of the Purchasing Agents Association of Philadelphia, 1924-25; of the Purchasing Agents Association of New York, 1927-28;; and vice-president

T. W. Harris, Jr.

of the National Association of Purchasing Agents, 1930-31.

Mr. Harris joined the Du Pont Company in 1915 as a buyer and in 1925 became a division purchasing agent, a post he held until he became Purchasing Agent of the company in 1945.

He was graduated from Pennsylvania State College, receiving his bachelor of science degree in mechanical engineering. While he worked at Westinghouse Elec-

(*Please turn to page 278*)

BEYOND THE HORIZON A FISHING FLEET RACES FOR PORT

From many a battle with stormy seas, the fisherman has gained a keen respect for the dangers of his trade. He equips his vessel with every possible safeguard. None is more vital to his safety than the Exide Batteries which provide power for lights, radio, direction finding, depth sounding, engine cranking, interior communication and other electrical services.

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SUBSIDIARY OF DODGE MFG. CORPORATION, MISHAWAKA, INDIANA

(*Continued from page 276*)

tric and Manufacturing Company, East Pittsburgh, as assistant to the works steam engineer, he studied power engineering at the University of Pittsburgh and in 1917 he received his mechanical engineering degree from Penn State.

Mr. Harris has won the Shipman Medal, awarded for outstanding achievement in his profession by the National Association of Purchasing Agents. He served as vice-president and treasurer of the National Association of Purchasing Agents in 1927 and as vice-president and financial officer during 1928. He has served as chairman of the association's coal committee from 1925 until 1946.

He served for ten years on the Coal Classification Committee sponsored by the American Society for Testing Materials and during 1944 and 1945 as a member of the U. S. Government Industrial Committee of the Solid Fuels Administration. He was for five years a member of the Board of Councillors of the American Petroleum Fuels Institute.

H. B. Garrett

Harold B. Garrett has been appointed Assistant Director of Purchases to succeed Mr. Harris, and L. R. Bailey, an assistant division Purchasing Agent, succeeds Mr. Garrett as division Purchasing Agent in charge of the Chemical Division.

Mr. Garrett started work with the Du Pont Company in 1917 as a laborer at the Deepwater Point, N. J., plant. Before he had been at the dye works a year, he was made a chemical operator and later he was advanced to shift supervisor. In 1918 he was transferred to the Purchasing Department in Wilmington and was made an assistant buyer. Four years later he became an assistant division purchasing agent and in 1931 was advanced to division purchasing agent. He was graduated from Washington College, Chestertown, Md., receiving his bachelor of science degree in chemistry in 1917.

Mr. Bailey joined the Du Pont Company in 1925 as an office assistant following graduation from Colgate University, where he majored in chemistry. In October, 1925, he entered the New York office of the Purchasing Department and was shortly made an assistant division purchasing agent. During the war he was manager of the priorities section of the Purchasing Department.

James P. Smith has succeeded Carl G. Schreyer as Purchasing Agent for the Bell & Howell Co., Chicago, Ill. Mr. Schreyer has been named assistant treasurer.

(*Please turn to page 280*)

What they learned in a printing plant may be *your key* to savings!

SHOWN above is a bronze printing press roll. It is one of hundreds cast by the Shenango-Penn *centrifugal* process and then completely finished to specification in the modern Shenango-Penn shops.

Printing plants supplied with these rolls find them to be superior to ordinary rolls. The printers save time and money. The press manufacturers or equipment suppliers save plenty, too! Here's why . . .

The Shenango-Penn centrifugal process provides stronger, pressure-dense castings with finer-than-usual grain. So the rolls readily take an ideal mirror finish, last longer, are better able to resist breakage or distortion. Trouble is avoided. Maintenance and service time is reduced. Moreover, metal is saved. So is finishing time, because there's less machining to do! And finally, imperfections such as sand inclusions and blow holes simply don't exist! There are fewer wasteful rejects. The finished rolls do a better job! Longer!

However, Shenango-Penn experience and facilities aren't by any means limited to bronze rolls. Here, virtually *any* symmetrical part, tiny or huge, ferrous or nonferrous, can be cast centrifugally and furnished rough, semi- or finish-machined, as you wish—bushings, bearings, sleeves, liners, collars, rings, etc. If you use or need such parts, we believe we can show you some really worthwhile savings and advantages. Why not let us *prove* it?

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In the Glare of the Torch— think of WILLSON

Style CW60

ROOM WANTED FOR SPECTACLES? . . . There's comfort for wearers of prescription glasses in Willson Cover-Alls.* And the adjustable leather bridge rests lightly on the nose without pressure. Willson-Weld* lenses in the shade you specify, of course.

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GAS WELDERS GO FOR IT . . . Assured protection of Willson-Weld lenses and comfortable face fit make this goggle day-in, day-out favorite for flame cutting and cleaning as well as welding. Indirect ventilating ports exclude glare.

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Harry O. Bercher has been appointed Director of Purchasing and Traffic of the International Harvester Co., Chicago, Ill. to succeed John Morrow, Jr., Vice-President of Purchasing and Traffic, who has retired after 45 years service with the company. Mr. Bercher will continue, also, as general manager of the Steel Division, which position he has occupied since 1946.

Mr. Bercher joined the company in 1928 at the iron ore mines at Hibbing, Minn. He served in various positions thereafter in the company's general office in Chicago, at the coal mines at Benham, Ky. and at Wisconsin Steel Works. He was appointed works auditor of the Wisconsin Steel Works in 1937, became head of the order department of the Steel Division in 1941 and in 1945 was appointed assistant to the vice-president.

Mr. Morrow joined the Harvester company as an office boy in 1902 at the Springfield, O. works. He advanced through the purchasing department until in 1911 he was sent to Europe to install new stores record methods in Harvester operations abroad. He served two years in the armed service during World War I. After rejoining the foreign staff of the company he was appointed Inspector-General of Purchasing for all European operations of the company. He returned to this country in 1931 to become Manager of Purchasing for the parent company.

In 1935 he was elected Vice President of Purchasing, Traffic and Fiber operations, which position he held until he left the company to accept a commission as colonel in the army in 1942. He was re-elected vice-president in 1944.

G. W. Alexander has succeeded the late J. L. Bennett as Purchasing Agent of the Central of Georgia Railway Company, with headquarters at Savannah, Ga. C. A. G. Blomquist has been named Assistant Purchasing Agent.

George O'Gorman has been named college buyer for The City College, The College of the City of New York, and will supervise purchases for all branches of the college. Mr. O'Gorman, who was formerly buyer for the engineering department, replaces Ebner G. Bullwinkle, who recently resigned to accept a position at Drake University, Des Moines, Iowa.

J. Albert Robinson has been named Purchasing Agent for the Standard Tube Company, Detroit, Mich. Mr. Robinson, during the war, served in administrative capacities in the steel divisions of U. S. Maritime Commission and War Assets Administration at Washington, D. C. Prior to his Washington service he had been connected with Youngstown Sheet and Tube Company and Allegheny Steel Company.

William Lange has taken over the duties of General Purchasing Agent for the Michigan Chemical Corp., St. Louis, Mo., succeeding Charles Messerly, who was transferred to the company's office in Kansas City. Mr. Lange was formerly assistant purchasing agent for the company.

(*Please turn to page* 282)

PRECISION THREADING SPEEDS JOB. Bristol precision, famous for over 50 years in the instrument field, is strongly reflected in Bristol Hex socket screws. Careful design, close tolerances and precision threading by the most modern methods in the field assure socket screws that are accurate, uniform, spin easily into place, fit perfectly and wrench up tightly.

ALLOY STEEL ASSURES TOP STRENGTH. A special alloy steel, proved best by long service and heat treated under close control to get the proper balance of hardness and toughness, produces screws of great strength which will give long service under severe conditions.

QUALITY PROTECTED BY CRITICAL INSPECTION. Bristol inspection starts with physical testing of raw material . . . a close check on tolerances during production . . . testing the final product for hardness and ultimate strength . . . gauging for lead and pitch . . . plus 100% visual inspection before packing. If it's a *Bristol* socket screw . . . it's *right.*

FULL RANGE OF SIZES. A full range of sizes available: Bristol "Hex" Set Screws, No. 4 to 1" . . . Bristol "Hex" Cap Screws, No. 4 to 1" . . . Bristol "Hex" pipe plugs, 1/16" to 1¼" . . . other sizes to order. Order from your distributor. THE BRISTOL COMPANY, Mill Supply Division, 132 Bristol Road, Waterbury 91, Connecticut.

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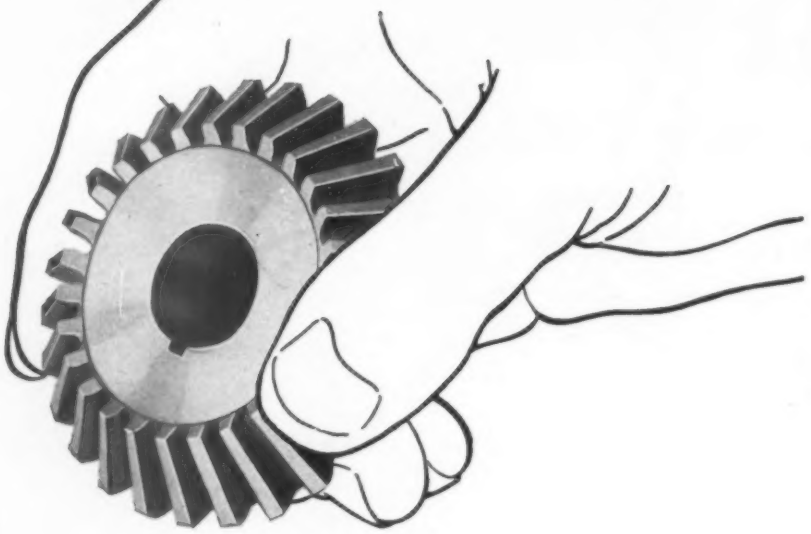

Whatever your gear requirements may be, we have the experience, equipment and facilities to fulfill them to your complete satisfaction.

Since the proof of the pudding is in the eating it may be pointed out that the manufacturers of the type of consumer goods which have a world-wide reputation for quality use PERKINS Custom-Cut GEARS as a matter of course.

You Furnish the Specifications • We'll Produce the Gears

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Our extensive facilities and modern machine tools are also adaptable to the manufacture of all kinds of various parts other than gears, such as the following:

SPROCKETS SPLINED SHAFTS SCREW MACHINE PARTS
up to 2¼" in diameter

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either in experimental or production quantities. Our well-known reputation is your guarantee of satisfaction. Let us quote on your requirements.

Leonard Grab has been named Assistant Purchasing Agent of Nekoosa-Edwards Paper Co., Port Edwards, Wis., under the direction of R. S. Holcomb, Purchasing Agent.

H. E. Schultz is acting in the capacity of purchasing agent for American Home Foods, Inc., Rochester, N. Y., following the resignation of L. C. Lorscheider as General Purchasing Agent. Mr. Lorscheider, who held the post for seven years, has joined the enterprises headed by Fred J. Strong, in Waukesha, Wis.

AMONG THE COMPANIES YOU BUY FROM

Rock Island, Ill. — Bear Manufacturing Company. Walter V. Hall has been appointed sales manager.

Pittsburgh, Pa.—Link-Belt Company. The company's district sales office has been moved to 5020 Centre Avenue.

New York, N. Y.—Bright Light Reflector Company. R. H. Jewell has been appointed sales representative in the company's newly opened sales office here. He will act as liaison man among Bright Light distributors in the greater New York area.

Chicago, Ill.—Pennsylvania Flexible Metallic Tubing Company. Edward Sala has been appointed manager of the mid-west branch of the company, and will be in charge of the branch office and warehouse at 4352 W. Harrison Street.

New York, N. Y.—Bemis Bro. Bag Co. Robert Highley has been appointed manager of the New York general sales division. Mr. Highley, who joined Bemis in 1916, had been acting manager of the office here before his present appointment.

Portland, Ore.—Wilson Welder and Metals Co., Inc. Industrial Air Products Company has been appointed electrode distributor in the state of Oregon. The main office is located at 3200 N. W. Yeon Avenue.

Kalamazoo, Mich.—The Market Forge Company. Bard Steel and Mill Supply Co., 251 No. Edwards Street, has been appointed stocking distributor for the company.

New York, N. Y.—Jefferson Chemical Company, Inc. J. W. Holmes has been named sales manager, with headquarters at 30 Rockefeller Plaza. The company is jointly owned by The Texas Company and American Cyanamid Company.

Wilmington, Del.—Hercules Powder Co. L. C. LeBron is now assistant manager of the company's explosives department's contractors division.

Springfield, Mass. — Monsanto Chemical Company Plastics Division. Edwin L. Hobson has been named sales manager of thermoplastic molding materials.

(*Please turn to page* 284)

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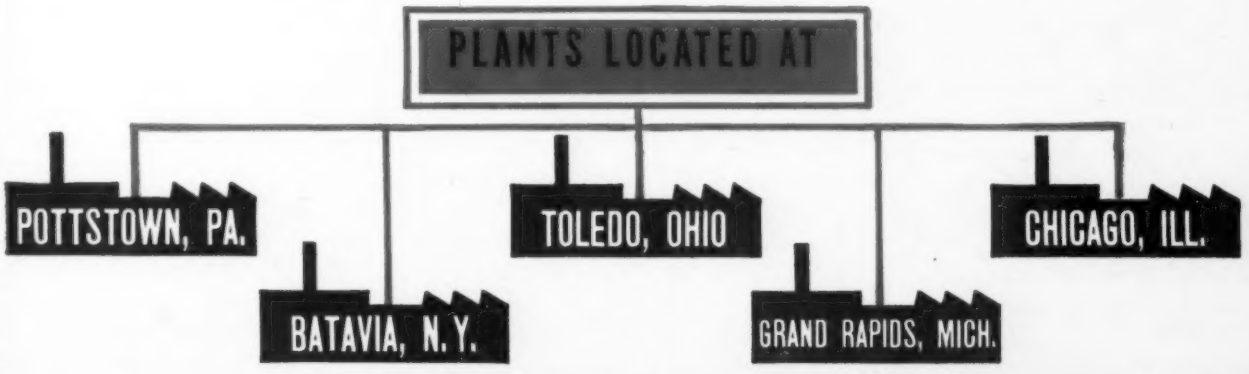

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A heading machine cutting sections from heated steel rods and compressing them in a die to a rough spherical shape.

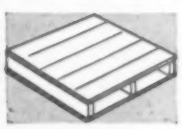
The steel is carefully chosen and inspected, even before it gets to the heading machine. After being "born" here, balls are carefully "brought up," through a long series of grinding and lapping operations, to the unbelievably high standards of finish, sphericity and precision which have made Strom Metal Balls the standard of Industry. Strom Steel Ball Co., 1850 South 54th Avenue, Cicero 50, Illinois.

Strom BALLS Serve Industry

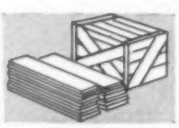
Largest Independent and Exclusive Metal Ball Manufacturer

Fast Action!

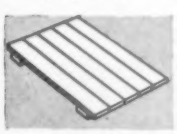
on LUMBER and LUMBER PRODUCTS



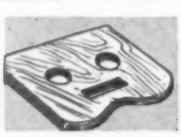
WOOD PALLETS



CRATING CUT TO SIZE



BOTTOM BOARDS



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Faster LIFTING Safer LOWERING with SIMPLEX

No. 22 10 Ton Cap.

RATCHET LOWERING JACKS

Specify **Simplex for Top Efficiency OR Heavy Duty Jacking**

SIMPLEX HYDRAULIC JACKS

Available in eight models to handle from 3 to 100 tons — tested to 50% overload. Write for Bulletin HJ-47.

Use these single acting jacks for safe, sure work in lifting, lowering, pushing or pulling. Double lever sockets speed work in cramped quarters. All models lift full capacity on the toe or on the cap — a feature that only Simplex gives you. Available in 14 models—capacities from 5 to 35 tons, and lifts from 7 to 18 inches. For full information, ask for Bulletin: Industrial 48.

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TEMPLETON, KENLY & CO.

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Philadelphia, Pa.—Pennsylvania Flexible Metallic Tubing Co. William Townsend has been named general sales manager.

Toronto, Ont.—Hercules Powder Company (Canada) Ltd. John O'Neill of the company's cellulose products department and naval stores department, is now located in a new office in the Metropolitan Building, 44 Victoria Street.

Chicago, Ill.—General Electric Company. William B. Frackleton has been appointed district sales manager of the central district of the company's chemical department. His headquarters are at 840 S. Canal Street.

Trenton, N. J.—John A. Roebling's Sons Company. E. George Hartmann has been named general sales manager. Mr. Hartmann, who has 29 years' experience in the wire field, has been associated with the company since 1940.

E. George Hartmann

New York, N. Y.—Worcester Pressed Steel Company. Charles J. Sauter has been appointed district agent for stampings and steel and has taken over the New York and northern New Jersey territory. His headquarters are at 17 East 42nd Street.

Chicago, Ill.—Link-Belt Company. H. Merrill Bowman, formerly district sales manager in Baltimore, Md., is now assistant division sales manager for power transmission equipment, with headquarters at the company's Pershing Road plant here.

Stamford, Conn.—The Yale & Towne Manufacturing Company. Richard H. Diesel is the new assistant general sales manager of the Stamford division of the company.

New York, N. Y.—Acme Steel Company. The New York office has been moved to 11 East 44th Street.

Boston, Mass.—General Electric Company. J. H. MacPhee has been named wiring device representative in the Northeastern district.

New York, N. Y.—Corbin Screw Division, The American Hardware Corporation. The company's showroom and warehouse has been moved to the Hudson-Charlton Building, 333 Hudson Street. Henry Ufer, manager of the New York office will be assisted by V. J. Merz and Charles J. Wickman as heretofore.

(*Please turn to page* 286)

AVAILABLE FOR IMMEDIATE DELIVERY . . .

(Improved Design)

NO. 960 BRASS PRESSURE REGULATOR

1. For initial steam or air pressures up to 250 lbs., reduced to within 80%. Sizes up to 2 in.
2. Can't wear out; every working part is renewable. Piston operates in removable cylinder liner.
3. Can be furnished for any of four service pressure ranges: 1 to 10, 5 to 30, 20 to 100, 90 to 200 pounds. Setting within each pressure range is by simple hand-wheel adjustment. Operation is completely automatic.
4. Maintains uniform reduced pressure at all times. Pressure cannot build up.
5. Simplified design: has minimum working parts. Fully accessible for inspection. Easy to service.

How to Choose the Right Size

For best results, having the right size pressure regulator for your needs is all-important. Get this folder with its handy size selector, and other data to help you order. Or, see your Crane catalog, p. 410-411.

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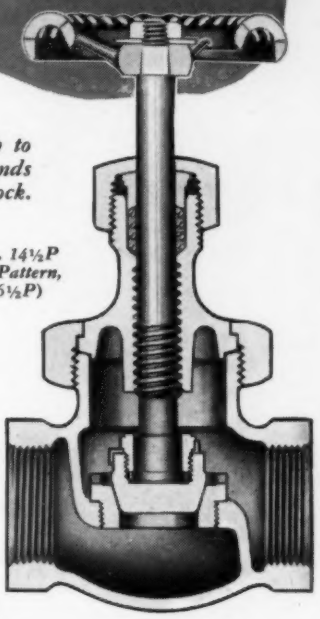
BEST FOR TOUGH SERVICES!

Working Pressures: *Up to 150 pounds steam; 300 pounds cold water, oil, or gas, non-shock.*

Cat. No. 14½P (Angle Pattern, No. 16½P)



150-POUND PLUG TYPE DISC BRASS GLOBE AND ANGLE VALVES

WHERE TO USE THEM

Recommended for all spots where flow is throttled, and where operating conditions are severe. Ideal for soot blower, blow-off, boiler feed, drip and drain lines.

WHY THEY GIVE BETTER SERVICE

They are designed throughout for tough work. Plug type disc and seat provide extra-wide bearing surfaces for maximum resistance to wire-drawing and damage by foreign matter. Taper of disc permits easy regulation of flow.

Seating materials (Crane Nickel Alloy to Exelloy) are harder, tougher, and stronger than metals ordinarily used in brass valves. They have higher resistance to wear, temperature, galling, and scoring. See your Crane catalog, p. 31 or

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Ground Thread TAPS

will produce **6** times as many threaded holes as a cut thread tap when tapping at high speeds

Your own time study records will prove this statement! Precisely ground and heat-treated HY-PRO high production taps are held to close tolerances. They are tough, accurate and longer wearing . . . require less sharpening . . . maintain their size longer . . . effect stronger fastenings in your assembly.

PROMPT DELIVERY. Many special as well as standard taps in stock.

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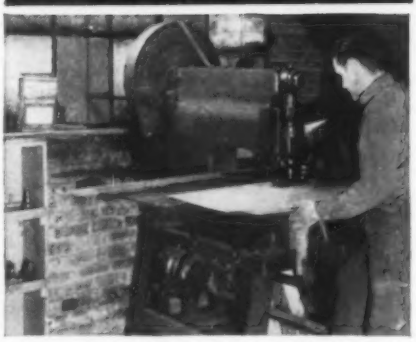
ASK THE MAN WITH DIRTY HANDS!



"Spun-Derma-C gets 'em cleaner, faster, without chapping".

"Spun-Derma-C is the first cleanser I've used that gets soldering acid stains off my hands. Does a 100% job, too, on all the other grease and grime I pick up . . . even when there's only cold water available on installation jobs. Best of all — NO MORE CHAPPED, SORE HANDS!!!", so says Bud Obermayer shown above at a punch press in the Merchants Equipment Co., Chicago, the stainless steel fabricating shop where he works. There's the answer for your men . . . from a man who knows. Spun-Derma-C removes paint, ink, grease, grime; combats dermatitis; lasts up to 1/3 longer. Cartons of 24, 5-lb. boxes; 100 or 300 lb. drums. Write for information.

Openings for Factory Representatives, Jobbers

Spun-Derma-C HAND CLEANSER

L. E. HICKS & SON, INC.
MFG. CHEMISTS

511 S. Grove Ave. Oak Park, Ill.

Los Angeles, Calif.—General Controls Co. Don S. Bentley has been named factory branch manager of the company's branch here.

Cincinnati, O.—SKF Industries, Inc. John H. Tipton is now assistant district manager of the company's office here.

Chicago, Ill.—James Flett Organization, Inc. Harry Pinkus has been made western division sales manager.

Cleveland, O. — Edward Valves Inc. Charles H. Tate Company has been appointed representative for northern Ohio and Erie county, Pennsylvania. Offices are at 992 Union Commerce Building.

Milwaukee, Wis.—Koehring Company. J. V. Miller has joined the sales staff of the company and will concentrate on products for railroads and the industrial field manufactured by Koehring.

Houston, Tex.—Reed Roller Bit Company. W. J. Vossbrinck has been appointed sales manager of the Cleco Division, which

W. J. Vossbrinck

has been organized as a separate division for the manufacture and distribution of rotary and reciprocating pneumatic tools.

Los Angeles, Calif.—Watson-Stillman Co. Plastics and rubber molding equipment sales in the territory south of the counties of Monterey, Fresno and Tulare will be handled by H. M. Royal, Inc., 48-14 Loma Vista Avenue.

Fennville, Mich—Wheel Trueing Company. Willard R. Gates has been named representative in the western Michigan territory.

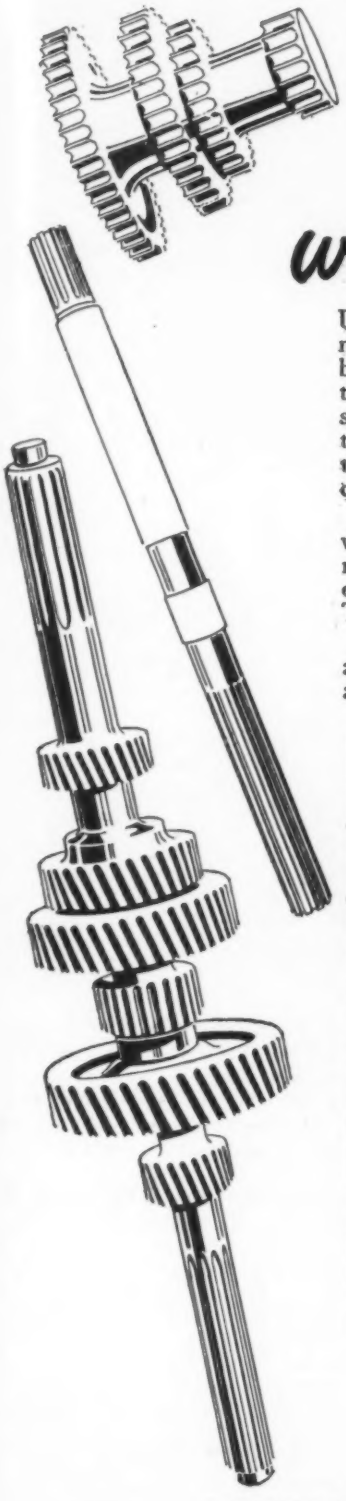
New York, N. Y.—The Dampney Company of America. W. T. Quimby has been named special representative in the New York area for Apexior and Thur-ma-lox protective coatings.

Philadelphia, Pa.—Ronaflex Tubing Co. Ronaflex tubing will now be distributed exclusively by the manufacturers, it has been announced.

Kansas City, Mo.—John Bath Co., Inc. L. C. Pensinger & Son, 1609 Oak St., have been appointed distributors for the company's taps, gages, micrometers and reference rings. They will cover Kansas and western Missouri.

(*Please turn to page* 288)

If you're making heavy duty gears, shafts and pinions for planes, trucks, buses and industrial machinery



Cut your Costs with U·S·S SUPERKORE *steels*

U·S·S SUPERKORE Steels meet a long-felt need. For here is a new series of improved carburizing steels which, although they cost *less* than more highly alloyed carburizing steels, show equal or greater hardenability—are easier to anneal—have improved carburizing characteristics—possess substantially improved machinability.

U·S·S SUPERKORE Steels were developed with two objectives in mind. To reduce your raw material and manufacturing costs. To equal or improve your product performance. They will do both.

U·S·S SUPERKORE Steels are now available in four different grades—each designed for a special type of heavy duty service. That's why it is important that they be properly selected and applied.

To help you get the full benefit of these steels in improving your product and reducing its cost, the cooperation of our service metallurgists — who developed U·S·S SUPERKORE Steels—is available. They will gladly help you in putting them to work, where, and *only where*, they should be used. They will show you how to iron out any application problems involved in their use.

The new "SUPERKORE Booklet" will give you further interesting information on these steels. For your copy write direct to Carnegie-Illinois Steel Corporation, Carnegie Building, Room 2008, Pittsburgh 30, Pennsylvania.

Here's where U·S·S SUPERKORE Steels can be used to advantage

Representative Applications	Present Steel	Recommended U·S·S SuperKore Alternate
Aircraft gears, shafts, pinions, etc.	E-3310, E-9310 or equivalent AMS Specification	U·S·S SuperKore A
Heavy duty truck and tractor gears, shafts, pinions, etc.	3316, 9316	U·S·S SuperKore AA
Heavily loaded gears, shafts, pinions etc. and carburized parts used in oil well drilling industry.	4815, 4820	U·S·S SuperKore B
Gears, shafts, pinions, etc.	4317, 4320	U·S·S SuperKore C

U·S·S Carilloy Steels

ELECTRIC FURNACE OR OPEN HEARTH

COMPLETE PRODUCTION FACILITIES IN CHICAGO AND PITTSBURGH

CARNEGIE-ILLINOIS STEEL CORPORATION

Pittsburgh and Chicago

Columbia Steel Company, San Francisco, *Pacific Coast Distributors*
Tennessee Coal, Iron & Railroad Company, Birmingham, *Southern Distributors*
United States Steel Supply Company, *Warehouse Distributors—Coast to coast*
United States Steel Export Company, New York

8-362

UNITED STATES STEEL

Shortages?

This book tells you "where to find it" in Indiana

The 1948 Indiana Industrial Directory—just off the press—is the most comprehensive buyers' guide ever published for the Hoosier state. Contains 250 fact-packed pages (size 8½" x 11") with complete, clearly classified information on 8,900 sources of supply.

More than a mere listing of Indiana's key manufacturers, processors and wholesalers, the Indiana Industrial Directory gives special attention to brand names, addresses, executives, branch offices, and approximate employment. All facts—over 100,000 in all—are clearly enumerated in three sections and accurately indexed.

Compiled and published by the Indiana State Chamber of Commerce, this directory is authentic and complete—a "must" for efficient, economical purchasing. Only $10 (prepaid). Order today.

CONTAINS 100,000 FACTS!

BUYERS' GUIDE: Complete, simplified listing of 8,900 manufacturers, processors and wholesalers, classified by products.

CIVIC ENCYCLOPEDIA: Detailed information on 689 Indiana cities and towns, listing location, population, transportation facilities and roads, utilities, banks, newspapers, hotels, radio stations—plus names of executives, products, brand names, branch offices and number of employes for all industries located in cities.

STATE-WIDE INDEX: Alphabetical listing of manufacturers, processors and wholesalers, enabling you to find any information you need in a matter of seconds.

INDIANA STATE CHAMBER OF COMMERCE

USE THIS HANDY COUPON!

Indiana State Chamber of Commerce

INDIANA STATE CHAMBER OF COMMERCE
201 Board of Trade Building, Indianapolis 4, Indiana

Enclosed is check (or money order) for_____copies of the 1948 Indiana Industrial Directory, @ $10 per copy (prepaid).

Name_____

Company_____

Address_____

City_____ Zone____ State_____

Pittsburgh, Pa.—Levinson Steel Sales Company. Louis Siegel has been named manager of the aluminum division of the company.

Chicago, Ill.—Monsanto Chemical Company. James P. Mahoney has been transferred to the organic division sales office here, where he will be in charge of Merrimac division sales and sales development.

New York, N. Y.—Air Reduction Sales Company. Scott D. Baumer has succeeded Dr. G. V. Slottman as manager of the company's technical sales division. Dr. Slottman has been named technical assistant to the vice-president.

INDUSTRIAL DEVELOPMENTS

Nelco Tool Co., Inc., has moved from Brooklyn, N. Y. to a new plant recently purchased at 266 Center Street, Manchester, Conn.

The National Screw & Manufacturing Company, Cleveland, O., has purchased the Chester Hoist Company, Lisbon, O. The Lisbon plant will be known as the Chester Hoist division of the National Screw & Manufacturing Company.

New Armstrong Bros. Plant

Armstrong Bros. Tool Co. now has its general offices and works in a new plant at 5200-5300 W. Armstrong Avenue, Chicago 30, Ill. The plant has over 170,000 square feet of manufacturing space.

The Elmira Foundry Co., Inc., Elmira, N. Y. has been made an integral part of the General Electric Company. Formerly a G. E. affiliated company, the foundry becomes one of the major works and 24 factories composing the apparatus department.

Truck Man, Inc., formerly a division of Yard-Man, Inc., Jackson, Mich., has incorporated as a separate and distinct unit to carry on the manufacture of Truck-Man lift trucks and platform trucks. Yard-Man, Inc. continues as manufacturers of lawn mowers exclusively.

American Cyanamid Company has announced the acquisition of the S.T. Dahl Company, Los Angeles, Calif. The Dahl company has been sales agent for the industrial chemicals division of American Cyanamid since 1925 and has represented the plastics division on the west coast for the past several years.

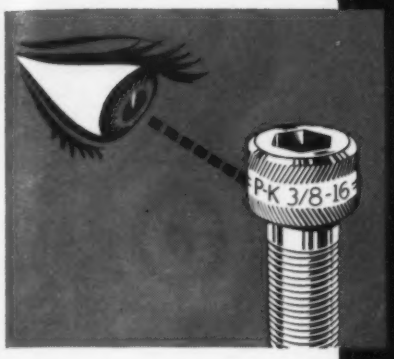
(*Please turn to page* 290)

YOU'RE O.K. WITH

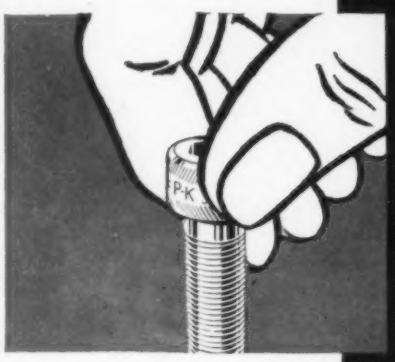
P-K* SIZE-MARK GEAR GRIP†

SOCKET HEAD CAP SCREWS

SIZE IDENTIFIED



WORK SIMPLIFIED



*REG. U.S. PAT OFF. †U.S. PAT. NO. 126,409

THERE'S NO GUESSING with P-K Size-Marked Gear Grip Socket Head Cap Screws. No need to "mike" or gauge . . . no chance for error. The correct size, incised on the head, can be seen at a glance. Installation and repair work on your product or equipment is made simpler and easier — thus adding a valuable sales feature.

NEW WORKERS learn faster — can work faster with Size-Mark. Tests show that even experienced men often guess wrong on size and thread pitch. So why take a chance, when you can tell at a glance — with P-K.

GEAR GRIP prevents slipping and fumbling, speeds assembly, especially when busy hands are oily.

ONLY P-K offers both Size-Mark and Gear Grip in Socket Head Cap Screws. See how they save time and trouble all along the line. Ask for samples. Parker-Kalon Corp., 200 Varick St., New York 14, N.Y.

AVAILABLE FOR PROMPT DELIVERY

GROUND THREAD Socket Set Screws

Another P-K First

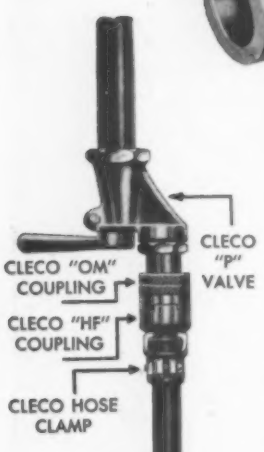
PARKER-KALON COLD-FORGED **SOCKET SCREWS**

SOLD ONLY THROUGH ACCREDITED DISTRIBUTORS

OTHER PARKER-KALON PRODUCTS SELF-TAPPING SCREWS • HARDENED SCREWNAILS AND MASONRY NAILS • SHUR-GRIP FILE AND SOLDER IRON HANDLES • METAL PUNCHES • DAMPER REGULATORS AND ACCESSORIES

Be sure THAT YOU GET *genuine*

CLECO HOSE FITTINGS AND ACCESSORIES

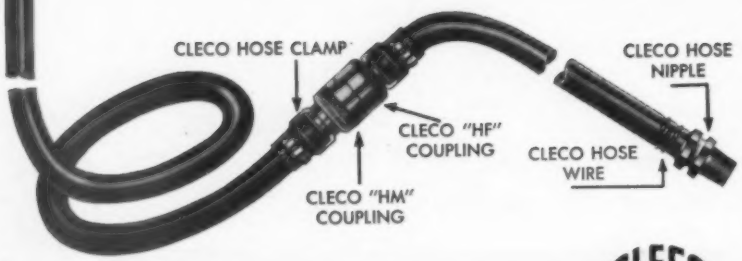


These products are leaders in the industry and have gained world wide acceptance in every place where compressed air is used.

For safety, economy and durability use Cleco Couplings.

They can be obtained only through The Cleco Division of the Reed Roller Bit Company or their licensed agents.

FOR FULL INFORMATION ON THESE **PROVED PRODUCTS** *write for* **BULLETINS** C-647 and HF-747



CLECO AIR TOOLS — CLECO ACCESSORIES

CLECO DIVISION

of the REED ROLLER BIT COMPANY, P. O. Box 2119, Houston, Texas, U.S.A.

DIVISION OFFICES

MISSOURI	NEW JERSEY	RAILROAD DEPARTMENT	OHIO	PENNSYLVANIA
2322 Locust St. St. Louis	75 Lock St. Newark	50 Church Street New York 7, New York	431 Temple Bar Bldg. Cincinnati	Mascher at Lippincott Sts. Philadelphia, 33

IN CANADA: CLECO PNEUMATIC TOOL COMPANY of CANADA, LTD., 927 MILLWOOD ROAD, TORONTO (LEASIDE), ONTARIO

DISTRIBUTORS IN PRINCIPAL CITIES OF THE UNITED STATES AND THROUGHOUT THE WORLD

Kaiser-Frazer Corporation has purchased a blast furnace and coke ovens in Ironton, Utah from the War Assets Administration for $1,150,000. The plants have a capacity of 300,000 tons of pig iron a year, which will be used in Kaiser-Frazer foundries and supplied to other industries supplying steel products to the Willow Run plant.

Koppers Company, Inc. will acquire all outstanding stock of Missouri-Illinois Furnaces, Inc., an Illinois corporation formed in October to purchase the government-owned blast furnace and coke plant at Granite City.

Apex Smelting Company, Chicago, Ill., has announced the purchase of the real estate, plant, equipment and certain inventories of the National Smelting Company, Cleveland.

Reliance Electric & Engineering Company, Cleveland, O., has purchased the land and building of the Detroit Steel Corporation at 1170 Ivanhoe Road, Cleveland. The building will be used to increase capacity for the production of larger electric motors and generators and V-S drives.

New Detecto home

Detecto Scales, Inc. has acquired a new home in a five-story factory building between Nostrand Avenue and Sanford Street, Brooklyn, N. Y. All manufacturing operations will now be consolidated under one roof. The building contains 2 2,300 square feet of floor area.

The Industrial Equipment Company, with offices in Buffalo, Rochester and Syracuse, N. Y., has changed its name to the Tri-Line Corporation.

Heyden Chemical Corporation, New York, N. Y., has purchased the minority interest of the Borden Company and now owns more than 99 per cent of the stock of American Plastics Corporation, Bainbridge, N. Y. The plastics firm produces casein plastics used in the manufacture of buttons, knitting needles and similar products. It is also engaged in custom moulding and extrusion of other plastic material.

Union Manufacturing Company has acquired the Hannifin air chuck and air chuck cylinder business from the Hannifin Corporation, Chicago, Ill.

Camcar Products Co., Rockford, Ill., has completed its new one-story plant for the manufacture of special and standard screw products. The new plant has 45,000 square feet.

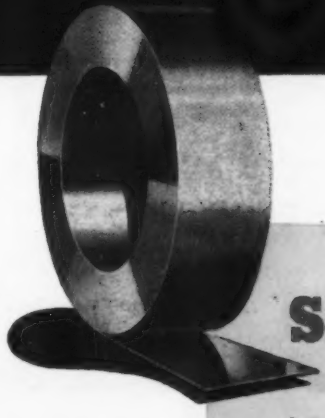
The Ohio Crankshaft Company has purchased the Induction Heating Division of The Budd Company, located in Detroit, Mich., for its Tocco Division.

(*Please turn to page* 292)

Your customers receive
the most for the money with

Superior

YOU supply every "most-wanted" quality in your products when you fabricate with SUPERIOR Stainless Strip Steel. Available in grades for every type of service, Superior Stainless is of truly universal utility—and our experienced counsel is available over the widest range of stainless strip applications.



Superior Steel
CORPORATION
CARNEGIE, PENNSYLVANIA

THIS "Rubber Heat Pad"...

The Rubber Heat Pad is patented by Lamac Process Company, Erie, Pa.

CURED A PRODUCTION HEADACHE

This electrically heated rubber pad has reduced the time required for re-soling shoes in the famous Lamac Press by as much as 75%.

Continental made this improvement possible because it was able to develop a rubber compound that would withstand the intense heat generated by the electrical heating element. Continental also solved the equally difficult problem of positioning this heating element so that it would not shift and "short" itself when the pad was molded.

The success of this development is another example of the specialized assistance in rubber which Continental offers to design and production engineers.

If You Have Rubber Problems, Send for This Helpful Booklet.
Three minutes' reading time will give you a new conception of the assistance you can gain by consulting specialists in rubber. Just ask your secretary to write for a copy today.

Rubber by CONTINENTAL
RUBBER WORKS
1983 LIBERTY BOULEVARD • ERIE, PENNSYLVANIA

BRANCHES

Baltimore, Md.	Dayton, Ohio	Los Angeles, Calif.	Pittsburgh, Pa.
Boston, Mass.	Detroit, Mich.	Lutz, Fla.	Richmond, Va.
Buffalo, N. Y.	Hartford, Conn.	Memphis, Tenn.	Rochester, N. Y.
Chicago, Ill.	Indianapolis, Ind.	Milwaukee, Wis.	St. Louis, Mo.
Cincinnati, Ohio	Kansas City, Mo.	New York, N. Y.	San Francisco, Calif.
Cleveland, Ohio	Lancaster, S. C.	Philadelphia, Pa.	Syracuse, N. Y.

The Fafnir Bearing Company, New Britain, Conn., has acquired a building at 801-811 East 20th Street, Indianapolis, Ind., to serve as a warehouse and sales office quarters. The St. Louis, Mo. sales office and warehouse stock will be consolidated with the Indianapolis sales office in the new building.

Butler Manufacturing Company, Kansas City, Mo., fabricator of steel and other products, has purchased a factory building at Richmond, Calif. to serve customers in the Pacific coast states.

American Relay & Controls, Inc., makers of electrical relays, switches and specialized controls, has been purchased by David T. Siegel. The firm has moved to 4900 West Flournoy Street, Chicago 44, Ill.

The Chicago Pneumatic Tool Co., New York, N. Y. has announced plans for the construction of a new plant in Utica, N. Y. this spring. The plant will have over a half-million feet in floor space, all on one floor.

Pennsylvania Salt Manufacturing Company will build a new fluorine chemicals plant near Paducah, Kentucky, which is expected to be completed February 1949.

Inland Container Corporation has begun operations in a new plant in Macon, Ga. The plant integrates the complete conversion from tree to corrugated shipping container.

SOLVAY ORGANIZATION CHANGES ANNOUNCED

Solvay Sales Division, Allied Chemical & Dye Corporation, New York, N. Y., has announced the following changes in its branch office organization:

Woodward Allen succeeds the late Harral O. Pierce as manager of the branch office at Charlotte, N. C. M. S. Johnson succeeds Mr. Allen as manager of the Boston office, which serves New England. H. G. Phillips, Jr., formerly a salesman in the Cincinnati territory, has been appointed as manager of the Pittsburgh branch office, succeeding the late Brice S. Hull.

U. S. PLYWOOD ACQUIRES INTEREST IN DECO PLASTICS

United States Plywood Corporation, New York, N. Y., and The Mengel Company, Louisville, Ky., have jointly acquired a two-third stock interest and fifty per cent voting power in Blanchard Deco Plastics, Inc. Blanchard Bro. & Lane, and their associates, original owners, also hold one-third interest.

The name of the company shortly will be changed to Deco Plastics, Inc. It will continue to manufacture and distribute decorated vinyl plastic sheeting, presently known under the trade name of Blanchardized Vinylite, utilized extensively in upholstering, for wall coverings, and for industrial use. The product will be manufactured at plant facilities in Louisville. It

(*Please turn to page* 294)

Made to FIT YOUR GRIP

for faster, more accurate blows . . Get a PLUMB

The second-growth Hickory Handle on every Plumb Hammer is shaped for a comfort grip and tested for strength. The black, one-piece head is double tempered from special-analysis steel. When you use a Plumb Hammer, you'll be amazed at the speed, power and precision of your strokes. You'll find that the ease with which it handles cuts down muscular fatigue. Best of all, you can count on a Plumb to last a lifetime. Fayette R. Plumb, Inc., Phila. 37, Penna.

The red handle with the black head —exclusively Plumb

Quality Comes First

PLUMB

is FIRST in QUALITY

HAMMERS • HATCHETS • AXES • FILES

PLUMB

WHY USE 40 ? ? ?
OR EVEN 24 ? ?

When 8 will do

IT'S THE LAW . . .

Consolidated Freight Classification Number 17. Supplement No. 38—Effective Dec. 23, 1947. Rule 41. Section 7, Paragraph 2, Page 14.
(*Applies to ordinary staples, rivets, and stitches*)
"2. All flaps must be fastened with metal rivets, staples, or stitches not more than 2½" inches apart.

(INTERNATIONAL Staples)

"Staples made of flat wire of hardness not less than equivalent of Rockwell B90, and not less than .037 inch thick and not less than .074 inch wide, with not less than 1¼ inch crown, may be spaced not more than 5 inches apart. Such staples must be used either across the center seams or on both sides of center seams where outside flaps meet but need only be used where outside flaps overlay inner flaps."

SAVINGS GALORE!

Left picture shows a carton stapled the INTERNATIONAL way . . . ready for shipment. (Approximately 40 ordinary staples, stitches, or rivets would be required to close this same carton.) And talk about speed . . . one operator closes 400 cartons per hour with an INTERNATIONAL STAPLE MACHINE!

INTERNATIONAL STAPLE & MACHINE CO.

HAVERTOWN 10, PENNA.

VISIT US! Booth 513, 14, 15 AMA Packaging Exposition

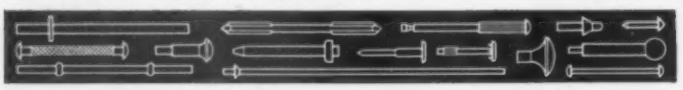
special nails • rivets • screws • made to your order

HASSALL cold-heading may solve your immediate special part problem . . . Special nails, rivets and threaded parts made in diameters from 1/32" to 3/8"—lengths up to 6". . . Rivets 3/32" diameter and smaller a specialty . . . Variety of metals, finishes and secondary operations . . . Economy, quality and quick delivery in large or small quantities . . . Tell us what you need . . . We will answer promptly. ASK FOR FREE CATALOG. 3-color Decimal Equivalents Wall Chart free on request.

JOHN HASSALL, INC. 404 Oakland Street Brooklyn 22, N.Y.

Manufacturers of Cold-Headed Specialties—Established 1850

SPECIAL NAILS RIVETS SCREWS
Hassall
ESTABLISHED 1850



(*Continued from page 292*)

is being produced currently at Hackettstown, N. J.

National sales headquarters for Deco Plastics, Inc., will be in the Weldwood Building at 55 West 44th St., New York, and the product will be distributed through Flexwood-Flexiglass distributors, U. S. Plywood Corp. Branches, warehouses of U. S. Mengel-Plywoods, Inc., and Blanchard Deco Plastics, Inc.

PAPER BOX MAKERS ANNUAL TO BE HELD IN CINCINNATI

The 30th annual convention of the National Paper Box Makers Association, Inc., is scheduled to be held at the Hotel Netherland Plaza in Cincinnati, May 9-12.

PAISLEY PLANTS CONSOLIDATED

President Joseph Morningstar of Morningstar, Nicol, Inc., recently announced the consolidation of its industrial adhesive manufacturing subsidiaries, Paisley Products, Inc. of Illinois, and Paisley Products, Inc. of New York. Earl C. Lenz formerly sales and service manager of the Chicago plant has been promoted to general sales manager, and L. J. LaBrie, formerly technical director, has assumed the position of sales manager of the New York Plant.

Earl C. Lenz

L. J. LaBrie

BAG CLOSING SEWING MACHINE CLINICS

Supplementing the personal service of its experts at user factories, the Bemis Bros. Bag Co. has established a "Sewing Machine Clinic" with two sewing machines specialists who have a specially mounted bag sewing head and other equipment, which moves from city to city, giving actual demonstrations and instructions on the handling of common problems encountered in sewing machine operation.

SEE REFRIGERANT SHORTAGE UNLESS CYLINDERS ARE RETURNED

A scarcity of "Freon-12" fluorinated refrigerant is ahead unless users stop hoarding shipping cylinders or sending them out of the country, Kinetic Chemicals, Inc., Wilmington, D. C., warned recently.

The situation is critical for the vital deliveries that start in February and extend through the spring and summer. Re-

turn of empties has dropped so low in the last three months that, unless there is an immediate change, production of the refrigerant and its distribution in cylinders will have to be cut.

Kinetic officials say that for eight months they have been shipping loaded cylinders far in excess of the empty ones returned. They have placed large orders for new cylinders. Due to the steel shortage, however, delivery of these is too slow to solve the problem.

They stress that ICC Specification cylinders should be used for shipping only, and not for storage. In spite of this, they suspect, many loaded cylinders are being bought up and stored, while others are being shipped overseas through exporters, possibly never to be returned.

Raw materials for making "Freon-12" are short but not critically so. Present and new factory capacity appears to be adequate. Lack of cylinders is the only bad bottleneck.

STEEL OPERATING RATE 92.7% OF CAPACITY

The operating rate of steel companies having 94 per cent of the steel capacity of the industry will be 92.7 per cent of the steel capacity for the week ending February 14, 1948, equivalent to 1,670,900 tons of steel ingots and castings, compared to 1,694,300 tons one week ago, 1,639,700 tons one year ago; and 1,281,210 tons for the average week in 1940, the highest prewar year.

BIG INCREASE IN INDUSTRIAL USE OF WIREBOUND BOXES

A 23 percent increase in the number of wirebound boxes and crates for shipping industrial products in 1947, as compared with 1946, was reported at the annual meeting of the Wirebound Box Manufacturers Association at Hollywood, Calif.

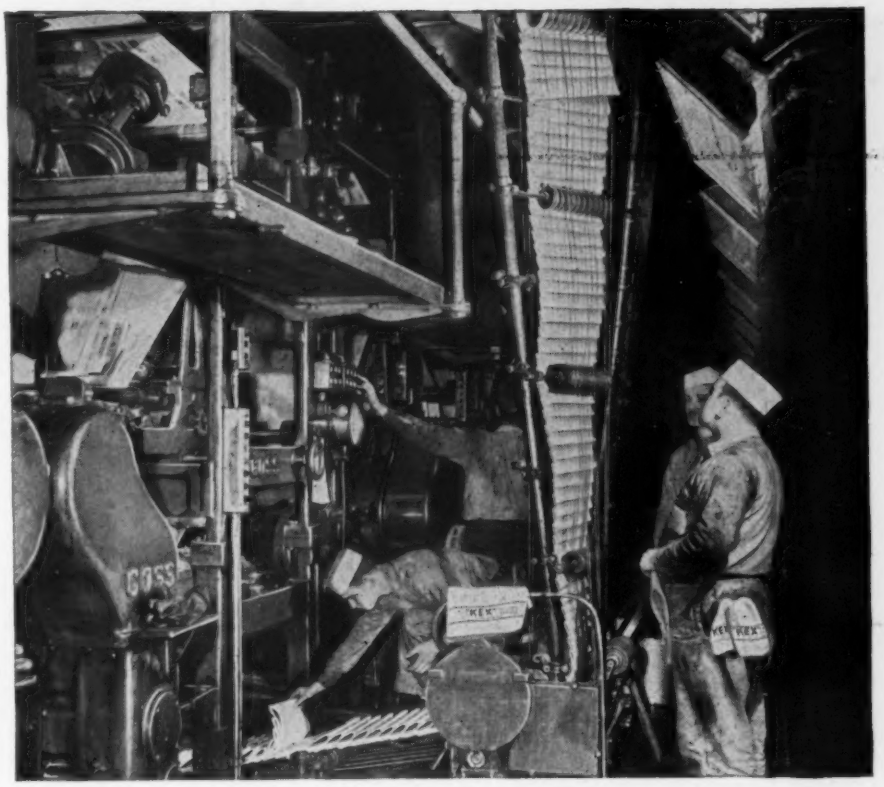
L. S. Beale, executive secretary, said that the wirebound shipping container industry, over 90 percent of which is represented by W. B. M. A. members, made 69,104,974 industrial wirebound crates and boxes last year as compared to 56,172,774 in 1946.

The consensus of the membership in round-table discussions was that the use of wirebound containers will expand far beyond the present level so long as the wirebound industry is not hindered by lack of basic materials—veneer, lumber, and wire.

Wirebound container manufacturers reported, generally, that a "tight" situation has developed in regard to veneer, largely on account of adverse weather conditions, but that wire at present is in satisfactory supply and that lumber, while high-priced, is available in sufficient quantities.

Much of the impressive increase in the use of industrial wirebound crates and boxes was credited by W.B.M.A. members to shipping and packing lessons learned by industrialists during the war and to improved engineering techniques and principles advanced by the wirebound industry itself.

"KEX" *Industrial Wiping* TOWELS



...More Important Every Day to the *AMERICAN INDUSTRIAL SCENE*

[Here—the Press Room, Chicago Sun and Times]

This important newspaper, as well as many other leading papers have found KEX Industrial Wiping Towels "made to order" for important wiping needs.

The reason—KEX Industrial Wiping Towels are produced especially for wiping. They are soft, with no harsh seams, no hidden buttons to mar delicate surfaces.

Every wiping towel is thoroughly cleaned and inspected before delivery to you. They come in neat, easily stored bundles that help you control distribution.

Follow the lead of industrial leaders who overlook no opportunity to keep operating costs down—and efficiency up.

Nothing to Buy—No Expensive Inventory—Just a Low Monthly Rental. The first month should show a decided saving on wiping costs.

For complete information, see your classified Telephone Directory for nearest KEX distributor, or write KEX NATIONAL SERVICE, 295 Fifth Avenue, New York 16, N. Y.

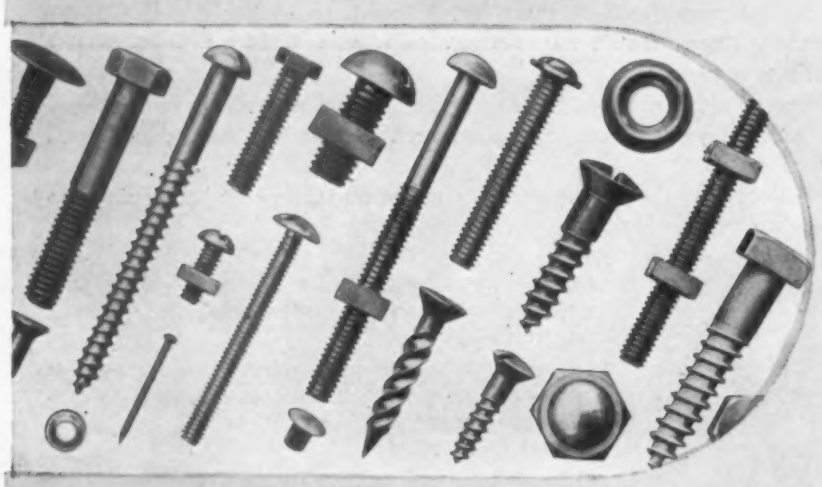
"KEX" NATIONAL SERVICE

REG. U.S. PAT. OFF.

The completely scientific production of HOLTITE screws, bolts and allied fastenings is closely supervised through every operation by our skilled Engineering Staff. From the analysis of raw material to the final hardening, heat-treating and finishing every operation is meticulously checked and inspected by the latest scientific devices. Modern comparators throughout the production line supplement inspection devices to insure absolute precision.

Aided by special research in extensive chemical and metallurgical laboratories, our engineers are constantly improving methods, equipment and products to provide users with the most rugged, uniform and accurate fastenings science can devise.

HOLTITE *Engineered Fastenings* effect tighter, stronger, vibration-defying assemblies with cost-cutting efficiency. Select your next requirements from HOLTITE'S complete line . . . your time study records will prove the wisdom of their continued use.



CONTINENTAL
SCREW CO. New Bedford, Mass., U.S.A.

STEEL USAGE PER CAPITA 6 to 7½ TONS

Steel is now more than ever the basic metal of our economy, with 12,000 to 15,000 pounds in use today in this country for every inhabitant, according to Charles M. Parker of the American Iron & Steel Institute, New York.

The amount of steel in use in this country, which at the present time is far more than ever before, greatly exceeds the amount per capita in any other country, he said. Since 1900, more than two billion tons of steel have been made in the United States and it is estimated that close to one-half of it is still in use.

More than 33,600 manufacturing establishments are now using the products of the steel industry, a number nearly 65 per cent greater than in 1939. In 19 days of operations at its recent rate of activity, he said, the steel industry can produce as large a tonnage as was made in the best years of each of the major non-ferrous metals combined. He also stated that the steel industry is depending on foreign sources of supply for the bulk of its requirements in nickel, tin, manganese, cobalt and chromium and for a sizable portion of its needs for tungsten and vanadium.

HEATING AND VENTILATING BUYERS' DIRECTORY

The 1948 edition of the Heating and Ventilating Buyers' Directory is a 320 page, 5⅝" x 8¼" volume covering the fields of air conditioning, piping, heating, refrigeration, ventilation, and air sanitation. It is primarily a product directory, listing the names of manufacturers or sources of supply of equipment, supplies and services.

A trade name section includes both current and obsolete trade names together with the product with which it is associated and the name of the manufacturer. Street addresses of manufacturers are listed separately in the closing section.

Published by The Industrial Press, 148 Lafayette St., New York 13, N. Y., the Buyers' Directory sells for $1.00.

GAS TURBINE POWER PLANT BURNS POWDER-FINE COAL

Development of the gas turbine power plant to burn powdered bituminous coal is a nearly $3,000,000 research program supported by nine railroads and four bituminous coal producers, according to the Bituminous Coal Institute, Southern Building, Washington, D. C. The first two experimental coal-fired turbine railroad locomotives are expected to be ready for road testing by early 1949. The gas turbine is really a "super-hot air" turbine requiring no water and having a high thermal efficiency. Many gas turbines will burn oil, but if the gas turbine will burn powdered coal, as is indicated, it will have an abundant and cheaper fuel in terms of heating energy per dollar of cost. The gas turbine has a great potentiality as railroad motive power and for stationery power and ships.

(*Please turn to page 298*)

a new record!

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Everybody *knows* and almost everybody *wears* Thom McAns. Put this fact to work to help solve your plant's foot safety problems.

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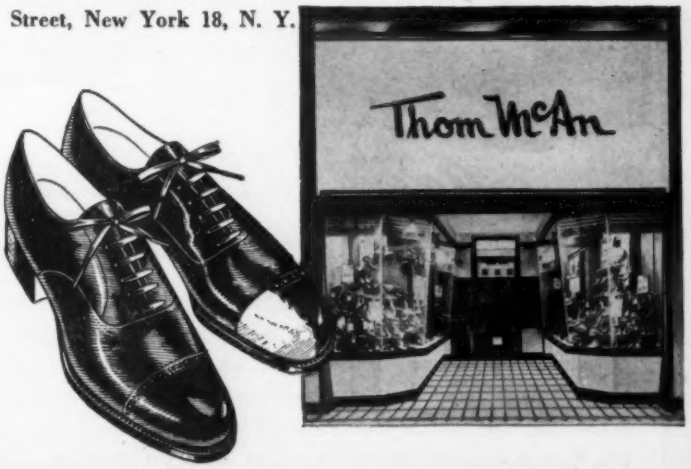
For complete details write today to: Thom McAn Safety Shoe Division, 25 W. 43rd Street, New York 18, N. Y.

Make this store your Safety Shoe Dept.



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Machine Tool Manufacturers strongly emphasize the need, not only to set machines level, but to keep 'em that way. Periodic re-leveling is essential for accurate work tolerances. How often, depends on the type of foundation. No method of machine setting is stable enough to maintain the accuracy of initial leveling. It is important to check after first month of operation, then check periodically and re-level whenever necessary.

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NEW DIVISIONS FORMED BY INDUSTRIAL PACKAGING ENGINEERS

The Michigan Division of the Industrial Packaging Engineers Association has been formed at Detroit, Mich., with Harry G. Diefenderf of Wayne University as president, and Richard B. Hiltz, Hinde & Dauch Paper Co., Detroit, secretary.

At San Francisco, Calif., a committee headed by Eugene H. Schmitt of the Southern Pacific Railway Co., San Francisco, is organizing a division, and at Los Angeles, a group spearheaded by Gale Cunningham of North American Aviation, Inc., is working toward the formation of a Southern California Division.

DOW RELEASES TRADEMARK RIGHTS TO NAME "SARAN"

Donald Gibb, head of the plastic sales division of The Dow Chemical Co., Midland, Mich., recently announced that his company has formally released its trademark rights to the name "saran" permitting it to become the descriptive term of the product. Gibb said that the action was taken "in the interest of simplifying identification on various plastic materials whose chemical names have for years been confusing to press, trade and consumer alike."

The term saran applies to a series of thermoplastic resins chemically known as vinylidene chloride copolymers originally developed by Dow and especially known for their resistance to a wide range of chemicals. Monofilaments of the plastic are currently becoming prominent in the textile field. Moisture repellent packaging films and corrosion resistant piping are other important uses of the plastic.

HARDWOOD DIMENSION LUMBER COMMERCIAL STANDARD

Commercial Standard CS60-48, Hardwood Dimension Lumber, is announced by the Commodity Standards Division, National Bureau of Standards, Washington, D. C., effective as of Februray 25.

AUTOMOTIVE LIFTS STANDARD

A commercial standard for hydraulic, hydropneumatic, and mechanically operated automotive lifts, designated CS142-47 has been issued by the National Bureau of Standards. Copies may be obtained at 10 cents each from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.

NEW COMMERCIAL STANDARD FOR HOT ROLLED RAIL STEEL BARS

On recommendation of the Rail Steel Bar Association, the Commodity Standards Division of the National Bureau of Standards, Washington, D. C., is sending to producers, distributors and users of hot rolled rail steel bars, copy of recommended

(*Please turn to page* 300)

AN INVITATION TO BUSINESSMEN *on behalf of producers of the world's goods, from*

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BRAZIL
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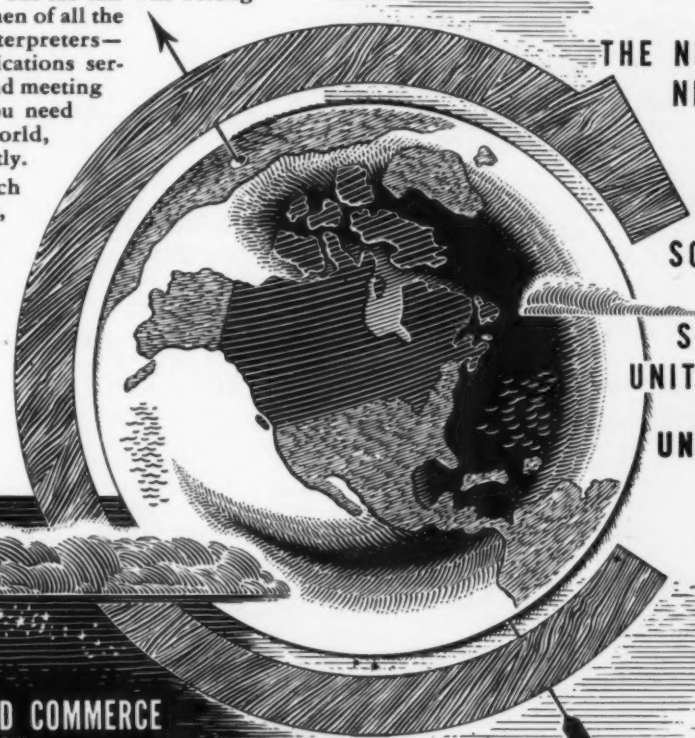
This will be the first International Trade Fair ever to be held in North America. It is sponsored by the Government of Canada, which cordially invites United States businessmen to attend.

It will be devoted entirely to business. The general public will not be admitted. Every exhibit has been accepted on the condition that the goods displayed are for sale and can be delivered within a reasonable time. Transactions can be completed on the spot.

The products of more than 25 countries will be on display, and buyers will come from every quarter of the globe. For the period of this fair, Toronto will be a world market-place—the sample room of the world on your doorstep—within a convenient day's journey from any city in the United States.

Canada will be the host—but the fair will belong to the traders and businessmen of all the nations. There will be interpreters—special cable and communications services—private restaurants and meeting rooms—all the facilities you need to do business with all the world, comfortably and conveniently.

Official invitations, which are required for admission, may be obtained on application to the Canadian International Trade Fair, Canadian National Exhibition Grounds, Toronto, Canada. Early requests will help to assure accommodation.



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(*Continued from page* 298)

commercial standard TS-4520, for their written acceptance prior to publication.

The purpose of the standard is to set an attainable standard of quality, recognized standard sizes, manufacturing tolerances considered standard for the industry, and provide efficient designation of size and properties as a basis of common understanding between manufacturers, distributors and users of rail steel products other than concrete reinforcing bars which are covered by Simplified Recommendation R26.

The standard provides minimum specifications for properties and covers size tolerances, nominal dimensions, shipping practice, and standard marking for hot rolled rail steel products which currently are in general use and demand.

Rail steel is the established trade and technical term used to identify products of the industry and is applied consistently as an accurate description of the industry's variety of products in all sizes.

ALUMINUM SPRING LOCK WASHERS

An aluminum spring lock washer, designed for use in all types of light metal and light metal assemblies, is said to have all the advantages of the light weight, corrosion resistance and other features of aluminum, and at the same time to have equal strength and spring tension of a bronze or stainless washer.

Known as the Diamond G the washer was developed by the George K. Garrett Co., 1421 Chestnut St., Philadelphia, Pa. According to the company, they were able to devise a new method of heat treating aluminum that would make possible the new lock washer. The washer will be manufactured in all standard and special sizes as required by various industries using light metal products.

FRESH WATER FROM SEA WATER 0.1¢ PER GAL.

Fresh water of great purity can be distilled from sea water at a cost of about one-tenth of a cent per gallon, according to Robert V. Kleinschmidt of Shoneham, Mass., who described the Kleinschmidt Vapor compression distilling units that were developed for the United States armed services, in an address on "Technical and Economic Aspects of Water Purification for Ships," at the 68th annual meeting of the ASME. He is a professor in the Harvard Graduate School of Engineering.

High fuel economy is attained with the equipment, it was shown. As much as 165 pounds of water are produced per pound of fuel, as compared with 30 to 40 pounds from older types of evaporators, according to Prof. Kleinschmidt. The purity of the water makes it suitable for storage batteries, and it has recently been used for the exacting standards of pharmaceutical solutions which require not only the highest purity but absolute sterility.

UNLOADS FROZEN COAL FROM HOPPERS IN TEN MINUTES

An electric powered vibrating unit that unloads frozen coal from hopper-type railroad cars in an average of less than ten minutes and speeds the turn-around of these critically short cars, was recently demonstrated at the Inland Steel Company's Indiana Harbor Works. In addition to greatly diminished labor requirements, there is decreased damage to the railroad equipment. Under normal conditions the Shakeout, requiring only one or two men to operate, can empty a 50 or 70-ton hopper containing bulk materials such as coal, ore, coke or limestone in two to five minutes, it is claimed. Manually the same operation requires a crew of eight to eleven men working 15 minutes to more than an hour for unloading a car. The five-ton Shakeout is placed astride the sides of the car, by a hoist. In operation it sets up rhythmic harmonics within itself—more than 1,000 impulses a minute, which are transmitted by contact to the car and its contents. Men are not required to be in or on the car during the operation. The Shakeouts are made by the Robins Conveyors Division of Hewitt-Robins, Inc., Passaic, N. J.

"BIG BERTHA" OF THE POWER SHOVEL WORLD

Illustration shows what is said to be the world's largest shovel dipper, now being operated in coal fields near Cadiz, Ohio, by the M. A. Hanna Coal Company. The shovel is designed to lift 40 cubic yards of earth at a single bite. It is used to strip deep overburden from coal veins, and on a 24-hour shift it bites a path 250 feet wide, in many instances 80 feet deep. It is powered by electricity. The dipper doors, 10 feet square, are hung on three hinges, each on a four-foot center. These are fitted with rubber bushings developed by Firestone Industrial Products Co., and consist of three steel rings and two rubber rings telescoped together. The rubber inserts are 5/8" thick on the inner ring and 7/8" on the outer ring. These serve to cushion shock incident to the heavy loads, and prevent shearing of the hinge pins—a frequent occurence previous to the installation of the bushings.

(*Please turn to page* 302)

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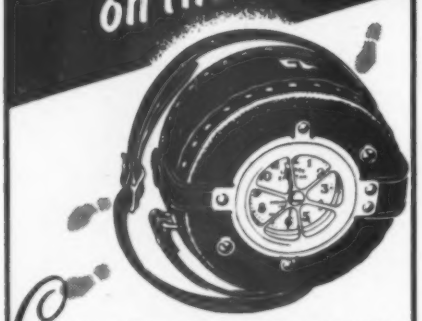

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ICELESS REFRIGERATOR CAR TESTED BY USDA

Tests conducted by the U. S. Department of Agriculture in cooperation with various industry groups, indicate that an iceless refrigerator car can maintain temperatures of approximately O° .F. under conditions of summer heat. This temperature, which cannot be reached by the ordinary refrigerator car, will maintain the prime quality of frozen foods.

The car in which the tests were conducted has 3-inch insulation and is equipped with a split-absorption system of refrigeration, an adaptation of a well-known method of refrigeration. Tanks attached to the underframe of the car hold the refrigerant, anhydrous ammonia, under pressure. Cooling is achieved as the ammonia moves from the tanks through a single regulating valve and expands in the cooling coils located in the ceiling of the car. When the ammonia has completed its refrigerating effect, it is finally taken up by water in absorber tanks also attached to the underframe of the car. There are no moving parts.

The ammonia consumption rate during the test period — February 11-21, 1947 — averaged42 pounds per hour. During the tests a single charge of anhydrous ammonia lasted 46 hours.

The tests, conducted in a car-testing laboratory at Potomac Yards, Alexandria, a., were made with a car loaded with cartons of frozen tangerine segements. The test car was placed in the test house on February 11, 1947. The air temperature inside the house was brought quickly to about 92 degrees and maintained at that temperature for the entire 19-day test. From the time the car entered the laboratory until February 21, the temperature of the air and frozen tangerines inside the car was determined every two hours by means of remote reading thermocouples and electric resistance thermometers. Test-house temperatures were also taken every two hours.

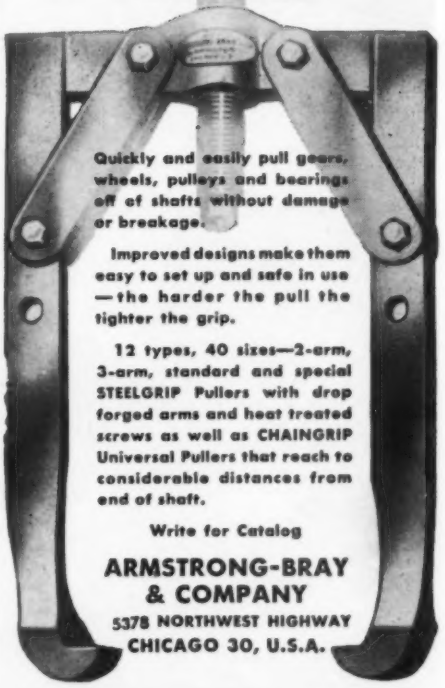
During the 10-day test the temperature of the frozen tangerines at the top of the load averaged from 4 degrees below zero to 1 degree above zero. At the bottom of the load, temperatures ranged from 3 degrees below zero to 3 degrees above zero. Improved wall and floor racks, allowing a freer circulation of air, would undoubtedly narrow the spread between temperatures at the top of the load and those at the bottom of the load.

The load of tangerines was hard frozen when placed in the car. The load was still hard frozen when removed at the end of the test period.

A detailed report on the tests may be obtained from the Marketing Facilities Branch, Production and Marketing Administration, U. S. Department of Agriculture, Washington 25, D. C.

YOU WILL FIND NEW SUPPLY-SOURCES LISTED EVERY MONTH IN PURCHASING'S CLASSIFIED SECTION! SEE PAGE 334

ARMSTRONG-BRAY GEAR and WHEEL PULLERS



Quickly and easily pull gears, wheels, pulleys and bearings off of shafts without damage or breakage.

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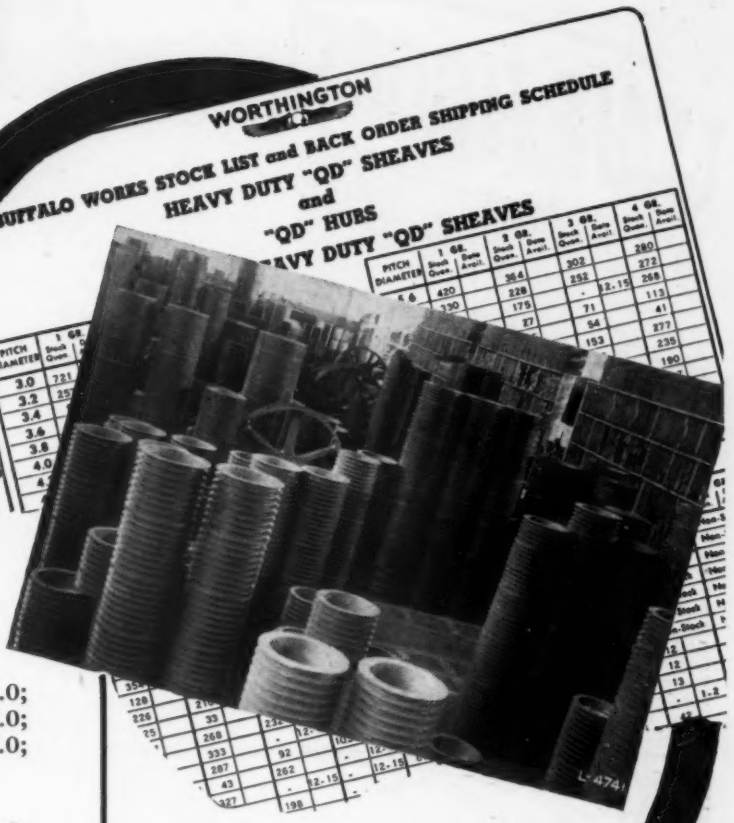

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B Section—1 to 4 Grooves
Pitch Diameters 4.0; 4.2; 4.4; 4.6; 4.8; 5.0; 5.2

B Section—1 to 10 Grooves
Pitch Diameters 5.4; 5.6; 5.8; 6.0; 6.2; 6.4; 6.6; 6.8; 7.0; 7.4; 8.6; 9.4; 11.0; 12.4; 13.6; 15.4; 16.0; 18.4; 20.0

B Section—2 to 10 Grooves
Pitch Diameters 25.0; 30.0; 38.0

C Section—1 to 6 Grooves
Pitch Diameters 7.0; 7.5

C Section—1 to 8 Grooves
Pitch Diameters 8.0; 8.5; 18.0

C Section—1 to 12 Grooves
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C Section—3 to 12 Grooves
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D Section—3 to 12 Grooves
Pitch Diameters 12.0; 13.0; 13.5; 14.0; 14.5; 15.0; 15.5; 16.0; 18.0; 20.0; 22.0; 27.0; 33.0; 40.0

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SILICONE RUBBER GASKETS USED IN CHEMICAL REACTORS

G-E silicone rubber gaskets that do not adhere to metal, withstand temperatures as high as 400°F and maintain their original characteristics under high vacuum are now being incorporated in chemical reactors used in the manufacture of G-E Glyptal alkyd resins, according to General Electric Co., Pittsfield, Mass.

Providing excellent resistance to alcohol, phenol, aromatic hydrocarbons, and other solvents, the material is particularly effective for use as a gasket material in the processing of these materials because of the absence of a plasticizer in the silicone rubber stock, it was said.

Use of the silicone rubber in the reactors for many months has proved that the gasket will not harden or crack under the severe conditions to which it is subjected, engineers stated. It further eliminates replacement problems encountered with natural rubber gaskets, it was said.

INFRARED AIDS PRECISION CASTING

Replacing steam tables, low temperature ovens, and hot plates, banks of 250-watt infrared lamps—248 in all—are used to dry the molds and melt out 98% of the wax pattern at the precision "lost-wax" casting foundry of the Westinghouse Electric Corporation. The rest of the wax is burned out in the preheat furnace where molds are heated to 1000° for casting. In making gas turbine blades and other hard to machine castings for customers within and without the company, the infrared process has been found to reduce mold cracking, thereby eliminating many defective castings.

LACQUERS AND SYNTHETICS

"Modern coatings are made in a great variety of types involving several hundred raw materials," states the Grand Rapids Varnish Corp., in brochure describing its new administration and laboratory building, Grand Rapids, Mich. "The oldest and best known type is based on vegetable dying oils, chiefly linseed, tung and soya. They give the good brushing and working properties demanded in the familiar

(*Please turn to page* 306)

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Direct from our mills on the west coast, we are supplying kiln-dried Ponderosa Pine and Douglas Fir in pre-cut lengths up to 4 ft., surfaced and smooth-sawn, ready for use or further fabrication. Widths and thicknesses to specification, straight or curved edges. Sold carload direct or pooled cars through Fond du Lac. Tell us what you need it for — we can save you money.

QUALITY BOX SERVICE CO.
49 N. Macy Street
Fond du Lac, Wis.

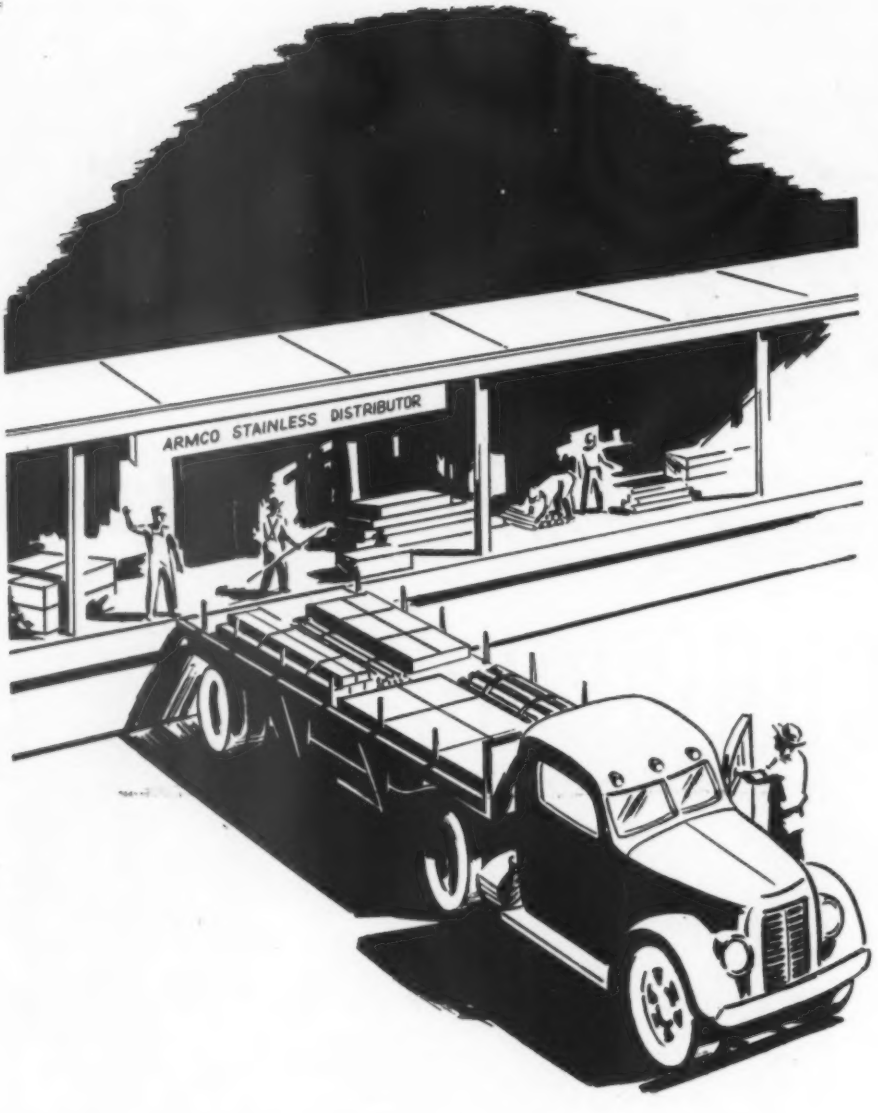
World's largest manufacturers of small wooden cheese boxes.

In every sport there is that one outstanding performer who can wear the mantle of a champion. Here, as in any competitive field of endeavor, some will lead and others follow. These champions are made, not born . . . behind them is the experience, training, proved ideas and new ideas, and inherent spirit that puts them in the vanguard.

Long experience in handling every conceivable gear problem, trained personnel, use of proved methods plus an open mind toward new developments, and a never-ending desire to surpass in quality and service . . . these are the winning standards of Illinois Gear, your source for finest gears.

ILLINOIS GEAR & MACHINE COMPANY

CHICAGO 35, ILLINOIS



YOUR STAINLESS STOCKS can be miles away from "home"!

When your production men put in a hurry-call for stainless steel, remember your nearest ARMCO Stainless Steel Distributor is ready to give you instant service.

This means three important advantages for you. **1.** You tie up less money in inventory; **2.** save valuable storage space, and **3.** obtain the services of an experienced metallurgical consultant.

Your Armco Distributor can give you *complete* stainless steel service too. He stocks popular types of ARMCO Stainless Steel sheets, bars, plates, angles, and fasteners.

More than likely he can ship your order the same day. If you need special grades he can obtain them for you quickly.

Next time you need stainless steels call the Armco Distributor nearest your plant. You'll find he can give you prompt, helpful service. If you don't know his name write or wire The American Rolling Mill Company, 200 Curtis Street, Middletown, Ohio. We'll be glad to give you the information you need.

Export: The Armco International Corporation

ARMCO DISTRIBUTORS

(*Continued from page* 304)

realm of general painting.

"Industrially, the drying oils have been largely displaced by two main groups, one known as lacquers and the other as synthetics.

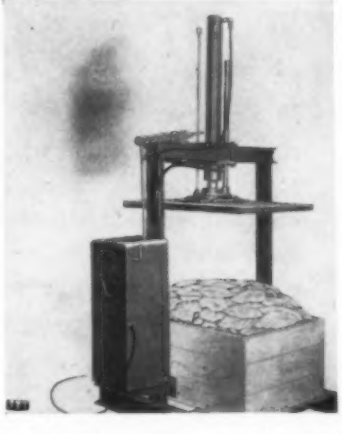
"Lacquers are made in a great variety of compositions, all based on the use of nitrocellulose or other cellulose compounds. They are noted for fast drying and for the smooth hard surfaces they produce. The manufacturers of furniture comprise the chief market.

"Synthetics, also spoken of as plastic coatings, are compounded from chemical raw materials, rather than from the natural vegetable oils and resins. Most of these materials are heat re-active, requiring baking at high temperature. Their hard, durable properties have given them a pre-eminent position in the field of metal finishes. Of relatively recent origin, their list is constantly growing by virtue of continued chemical research.

"Each of these groups and its component materials has specific advantages for certain uses; there is no single type of coating that is best for all purposes. It is the knowledge and experience of the coating technologist that must be relied upon to determine the best choice for each individual finishing job."

HYDRAULIC PACKING PRESS

Illustration shows a hydraulically operated packing press developed by the Lyon-Raymond Corp., 4088 Madison St., Greene, N. Y., to solve a rather common packing problem. A hydraulic cylinder and motor operated pumping unit is offered by Lyon-Raymond to be installed on a channel framework and replace manually operated presses now in use.



In many packing operations, it is necessary to press bulky materials into packing cases so that the top can be fastened down. Since various products differ in bulk, some must be compressed more than others. For this reason, the available piston stroke of the press is greater than required for any one operation but limit stops are provided. These may be pre-adjusted for any particular material, making the process practically automatic.

The hydraulic cylinder is a double acting type, both the extension and return strokes being power operated. The pumping unit consists of a ¾ H.P. motor, gear

type hydraulic pump, relief valve to prevent overloading, lever controls and self-contained oil reservoir. Hose connections between power unit and cylinder are flexible to allow easy installation.

BARREL CART

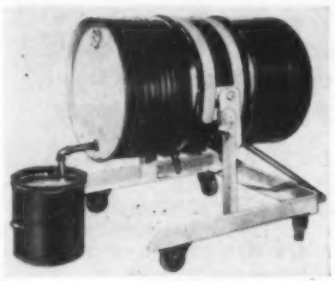


Illustration shows the Hodgson barrel cart, product of the Hodgson Engineering Manufacturing Co., 1505 E. 7th St., Tulsa, Okla., especially developed for moving, pouring, emptying, and mixing. The handle, which can be seen extending to the rear, locks at a convenient height for pushing or pulling the cart which is equipped with 4" castors and allows the cart to be moved with minimum effort. The handle, which has a leverage ratio of 8 to 1, when pulled down, raises the barrel 7½" from the floor. When raised, the barrel may be rotated end over end for mixing its contents, and as evidenced by the picture, pouring is a simple procedure without the use of a valve, pipe nipple and cap being used to prevent drips and evaporation losses.

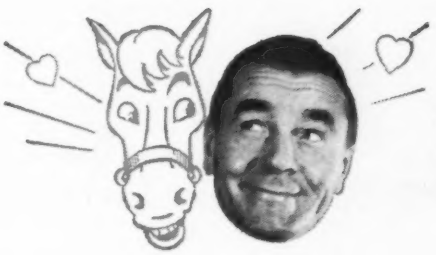
BETA-PROPIOLACTONE NEW ORGANIC CHEMICAL MATERIAL

Development of a new organic chemical material known as beta-propiolactone which it is claimed promises to become as important to the chemical industry as acetylene or chlorine, is announced by the B. F. Goodrich Chemical Company, Cleveland. It is described as "another fundamental tool in the complex science of manufacturing organic chemicals", statement being made that "Its use as a basic chemical makes possible for the first time in chemical history the commercial production of whole series of organic chemicals hitherto regarded as laboratory curiosities."

Substances which may be made from the new material, it is said, range from the liquid used in setting permanet waves to materials used in leather processing. Other fields in which it is expected to contribute either better or more economical products include: compounds for preserving fats and oils; thermo-setting resin products which can be made tougher and less brittle; plant growth initiators and mold-growth inhibitors; synthetic rubbers; fungicides; intermediates for the paint industry; rubber compounding chemicals and solvents, and "polyblends," in which American rubber and plastics are blended.

(*Please turn to page* 308)

Bucking up against RISING COSTS?



...here's a sure way to BREAK 'EM!

To tame high-and-mighty maintenance costs which stubbornly refuse to be controlled, look to better, quicker methods of sanitation.

By using proper cleaning materials, scientifically designed by West, you plug profit leaks at many sources. The initial cost of the proper sanitation product is trifling compared to the *time* and *effort* expended in using it. *Quicker-acting* West products for floors, washrooms and for personal protection save money because they save time.

They are formulated for easy application plus maximum efficiency and long-lasting effectiveness. Really a practical answer for helping industry solve a vital problem — maximum health protection at low cost.

West products can be profitably applied to your business. Why not consult one of nearly 500 trained West representatives throughout the United States and Canada. His cost-cutting suggestions will prove invaluable.

PRODUCTS THAT PROMOTE SANITATION

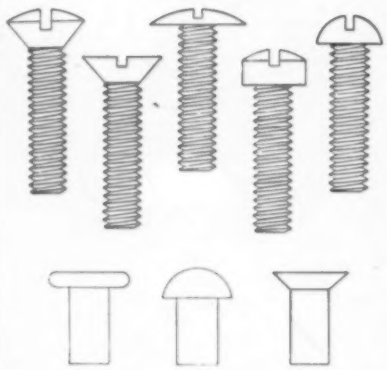
WEST DISINFECTING Company

42-16 West Street, Long Island City 1, N. Y.

CLEANSING DISINFECTANTS · INSECTICIDES · KOTEX VENDING MACHINES
PAPER TOWELS · AUTOMATIC DEODORIZING APPLIANCES · LIQUID SOAPS

PROMPT DELIVERY!

Stainless Steel
MACHINE SCREWS
and Rivets



SCREWS . . . nuts . . . washers . . . pins . . . Allmetal carries the largest stock in the country of stainless steel fasteners and screw machine parts. We also have facilities for heading, tapping, drilling, reaming, slotting, turning, stamping, broaching and centerless grinding, making possible prompt delivery of specials. We work not only with stainless and monel, but also with duralumin, aluminum, brass, bronze, or any other non-corrosive metal. All parts produced to close tolerances.

Largest stock in nation of Stainless Steel Fasteners

We also carry: Cap Screws, Bolts, Washers, Nuts, Wood Screws, Taper Pins, Cotter Pins, Pipe Fittings and Valves, Socket Screws, Wing Nuts, Thumb Screws, Self-tapping Screws, etc.

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ALLMETAL
SCREW PRODUCTS CO., INC.
33 Greene St., New York 13

SKF METALLURGISTS PROBE STEEL "CANCER"

Metallurgists of SKF Industries, Inc., Philadelphia, Pa., are concentrating on a drive to eradicate a type of "industrial cancer" that is costing U. S. industry unnumbered millions of dollars in losses each year. They are studying the unusual and baffling reactions in the crystals of steel which become "tired" due to stress "irritations," and cause objects like automobile axles, ball and roller bearings and other machine parts to crack and fail.

It is stated that the breaking up of the basic crystals or "cells" of hard metals accounts for more failures in modern engineering practice than any other single factor. The SKF metallurgists are concentrating on the extremely hard steel used in the manufacture of high-precision bearings for machinery of all types. H. O. Walp, head of the research program, explains: "Steel, like all metals, is crystalline. In the carefully heat treated parts of bearings these crystals are exceedingly small, but they are still crystals. The cohesive forces which hold material together are stronger toward the interior of such crystals than they are across the areas where one crystal meets another. Since the crystals are irregularly shaped, it seems, for instance, reasonable to conceive points in steel where two, three or more crystals meet and where the cohesive forces would, therefore, be particularly weak and subject to cracking or breaking under prolonged strain."

1 1 1

RUBBER PIPE USED FOR ACID WATER DISPOSAL

Rubber pipe, developed by hose engineers of Goodyear Tire & Rubber Co.'s mechanical goods division, has been installed successfully in an Ohio coal mine to replace a 600-foot metal pipe line used in ejecting acidic water.

The water is of such high acid content that conventional pipe was perforated within two weeks, according to Robert Featheringham, superintendent of the Warner Collieries Co.'s Wolf Run mine near Amsterdam, Ohio.

Especially compounded to conduct corrosive chemicals, the rubber pipe was installed in a single line of eight sections, totaling 380 feet and running from the pump up through an air shaft to discharge above ground. Flexibility of the hose, called Diversipipe, permitted use of the air shaft route, shortening the old line by 220 feet.

(*Please turn to page* 310)

KENNAMETAL
CEMENTED CARBIDE
TOOLS, BLANKS, and SPECIALTIES

- FOR FAST, ACCURATE METAL-CUTTING . . . complete selection of single-point tools and milling cutters.
- RESIDENT TOOL ENGINEERS in 24 cities available for expert help in proper selection and correct use.
- WAREHOUSES in Chicago, Cincinnati, Los Angeles, New York, and San Francisco to expedite delivery.

KENNAMETAL
SUPERIOR CEMENTED CARBIDES
KENNAMETAL Inc., LATROBE, PA.

IN "BRIEF"... The Best!

SO SURE are we that this is the best Brief Bag, that you may have your money back, unconditionally, if you don't agree.

It has everything you want in a brief case—extra-wide pockets, luxurious look, faultless construction to make it last through the years.

Made in heavy 6-7 oz. top-grain Cowhide . . . Saddle stitched with NYLON thread . . . Lock and hardware are solid brass . . . Sides reinforced with leather straps and steel slats to retain smart shape for the life of the bag. Colors: Suntan, Brown, Black.

SPECIAL 25% DISCOUNT

16 Inch Bag . . . 16x13x7½". Retail Price, Incl. Fed. Tax, $37.20.
Our Price, Incl. tax, $27.90

18 Inch Bag . . . 18x13½x8". Retail Price, Incl. Fed. Tax, $39.50.
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Send Check or Money Order.
We Ship Prepaid.

CONTEMPO LUGGAGE CO.
FLATIRON BLDG., NEW YORK 10, N. Y.

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NICKEL SILVER?

The answers to your questions on composition, specifications, tolerances, properties and characteristics are all contained in Seymour's latest, up-to-the-minute Nickel Silver catalog. It is an invaluable aid to the design engineer, production staff and purchasing department. This informative guide shows by chart and illustration the widespread applications and usefulness of the most important commercial alloys. Write for your copy today.

--PHOSPHOR BRONZE?

To manufacturers of electrical appliances, springs, stampings, bearings, etc., Seymour's Phosphor Bronze catalog provides long awaited data. A comparison of the leading Phosphor Bronze alloys, with complete specifications and properties, ensures the proper choice of alloy for each particular application. For the latest word on Phosphor Bronze, simply fill out and mail the coupon below. Your copy will be sent promptly.

NICKEL ANODES

Seymour Nickel Anodes, in all standard sizes, or made to your own design, are available in a number of special types. Complete descriptions of these outstanding anodes will be mailed immediately on request.

BRIGHT NICKEL

Seymour Bright Nickel, a hot organic process used with standard Watts bath, saves production costs by eliminating the need for buffing and polishing prior to chromium plating. Technical data and detailed descriptions are available for your consideration.

THE SEYMOUR MANUFACTURING COMPANY, SEYMOUR, CONNECTICUT
NONFERROUS ALLOYS SINCE 1868

Gentlemen: Please send complete information on the items checked.

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☐ **SEYMOUR NICKEL ANODES** ☐ **SEYMOUR BRIGHT NICKEL**

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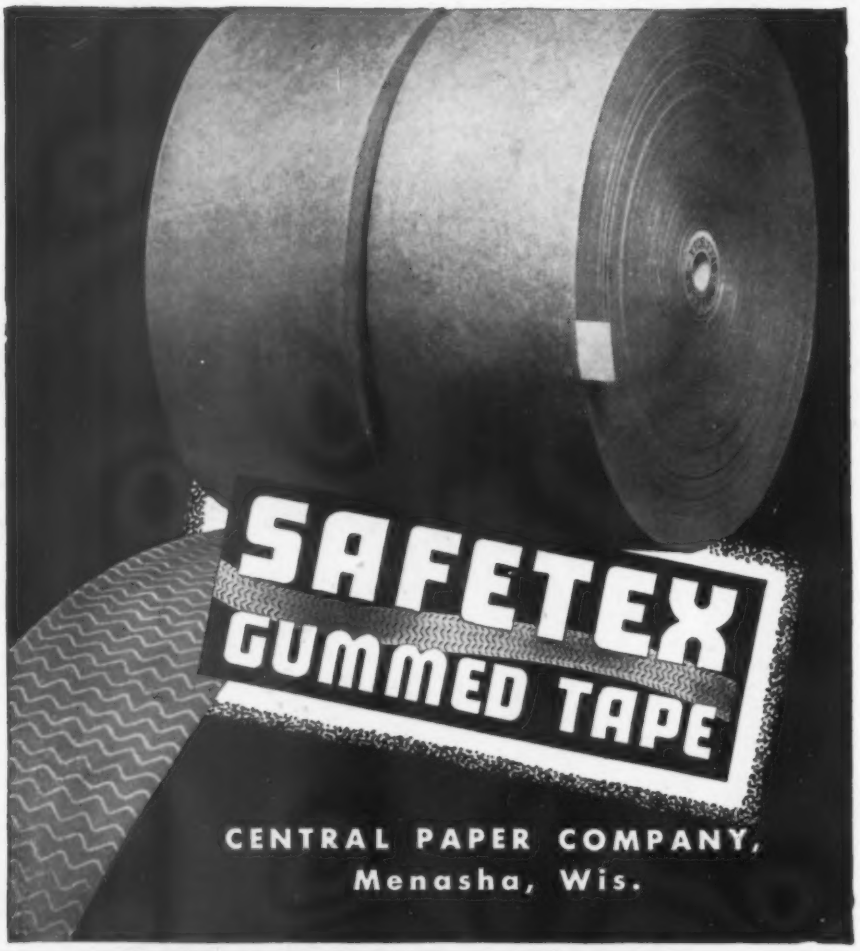


"The Outstanding *Basic* Improvement in FLEXIBLE SHAFT Machinery in 25 Years"

The NEW Strand Rotoflex 4-speed gear drive Flexible Shaft Machine (shown upper right) is another step forward in Strand quality precision tools for faster, easier, more economical production work. The Rotoflex 4-speed gear drive employs a patented, new type of quick change gear drive utilizing 4 positive speeds by a unique and easy method of instantly changing from one speed to another. Rotoflex machines are powered with totally enclosed ball-bearing motors having speeds from 850 to 9000 R.P.M., depending on motor.

Standard type Strand machines, (lower right) give portable rotary power at constant speeds with dependable results in all grinding, buffing, drilling, wire brushing and rotary filing operations. Hundreds of types and models from ⅛ to 3 H.P. available with suitable attachments for your specific requirements.

Distributors in all principal cities

Ask for Bulletin No. 43 and Catalog No. 30

Strand FLEXIBLE SHAFTS

N. A. STRAND & CO.
5005 NO. WOLCOTT AVE.
CHICAGO 40, ILL.

RUBBER REQUIREMENTS FOR NATIONAL SECURITY

Synthetic rubber production of 275,000 long tons a year for the next two years is believed the minimum requirement for national security, Dr. R. P. Dinsmore, vice president in charge of research and development for the Goodyear Tire & Rubber Co., Akron, told the Engineers' Club of Washington recently. There will also be required a stockpile of natural rubber which may be as much as 800,000 long tons, he said.

"If legislation permitted Rubber Reserve to cut plant retirement charges to around 1 cent per pound, as the industry recommends, the rubber could be sold at 15½¢ to 16¢ per pound. On the other hand if private industry produced the GR-S profits on the major materials and the rubber would have to be added, and there seems to be little hope of equalling or bettering a government cost. The probabilities are that the costs in private plants, for some time forward, would be at least 1¢ per pound higher," he pointed out.

"We may as well recognize the fact that by every indication, both from our own work and from what we know of the Germans' work it is unlikely that the GR-S type of rubber will ever be entirely competitive. It is probably that the competitor for natural rubber must come from new undeveloped fields of polymer chemistry, while GR-S takes its place as just another obsolete weapon of the late war."

✓ ✓ ✓

NEW REGULATIONS GOVERN ISSUANCE OF IMPORT LICENSES

New regulations governing the issuance of import licenses have been made public by the Government of India, the Department of Commerce announced today through its Office of International Trade. These regulations cover the period January-June 1948. The principal change from the controls previously in effect is the return to a distinction between dollar and non dollar areas of supply. This change was necessitated by the deterioration of India's dollar position.

Under the "standstill agreement" between India and Pakistan, a common import policy is to be followed by each country through March 31, 1948, and the new policy may therefore be considered as applicable to both countries.

In its announcement the Ministry of Commerce, Government of India, defines the dollar areas affected by its new import regulations as including all North, Central, and South American countries and the Philippines.

The announcement includes listings of the items subject to licensing or prohibition. The list of prohibited imports is shorter than the list of prohibitions in force through December 31, 1947. Removals of items from this list are more numerous than additions. Also included in the announcement is the form of application to be used by Indian importers seeking an import license. The original

order and the acceptance from the shipper, supplier, or manufacturer must be presented with the application, together with details of shipping weight and c.i.f. values. However, acceptance of an order does not guarantee that the import license will be issued. Shippers who accept orders are advised not to make shipment until they are assured that the license will be granted.

The complete listings and other particulars appear in the Commerce Department's Foreign Commerce Weekly of January 10, 1948. They are also available from the Office of International Trade or any of the Department's Field Offices.

WAA REVISES MACHINE TOOL DISPOSAL POLICY

War Assets Administration recently revised its policy for disposal of surplus machine tools and equipment released by the Joint Army and Navy Machine Tool Committee on request by industry.

Residual machine tools and equipment previously offered to priority and non-priority purchasers and released by JANMAT through February 14, 1948, offered to the requestor at the established fixed price, were subject to the dealer's discount of 17½ percent, if applicable.

WAA policy heretofore required that such tools and equipment released by JANMAT upon request by industry be re-offered through priority channels.

Machine tools and equipment which are residual after a previous offering to priority and non-priority purchasers and released subsequent to February 14, 1948, will be offered to the requestor at the established fixed price but will not be subject to the 17½ percent discount.

Machine tools and equipment released by JANMAT upon specific request which have not been offered previously to priority and non-priority purchasers, upon release, will be offered by normal procedure to the priority and non-priority purchasers and will not be subject to the 17½ percent discount.

CFC RULE 41—FIBREBOARD CONTAINERS

Fibreboard boxes made to conform to specifications of Rule 41, must bear certificate of boxmaker clearly showing that the boxes actually conform thus—"This box conforms to all construction requirements of Consolidated Freight Classification". Shipper, too, must certify on shipping orders and Bills of Lading—"The fibre boxes used for this shipment conform to the specifications set forth in the boxmaker's certificate thereon and all other requirements of Consolidated Freight Classification". Boxes of gross weight of 65 pounds must be made of minimum strength test board of 200 pounds per square inch; and boxes grossing 90 pounds must be fabricated of fibreboard of a minimum test per square inch of 275 pounds of combined board, Cady or Mullen test. Sample boxes should be submitted to an independent testing laboratory to verify the boxmakers certificate and avoid 20% L C L and 10% C L penalty for non-conforming boxes. *N.P.V. & L. Assn. Weekly Letter.*

(*Please turn to page* 312)

They checked and found that every square foot of Blaw-Knox Steel Grating has these advantageous features:

1. *One-piece* electroforged construction develops the full strength of all sections of metal used in manufacture.
2. *Maximum Open Area* for light and ventilation.
3. *Easy to Maintain* . . . easy to paint thoroughly.
4. *Self-Cleaning,* no sharp angles to retain debris.
5. *Safe* footing at all times due to twisted cross bar.

FREE . . . So that you can have a "close-up" of Blaw-Knox Grating construction, write today for this "paper-weight-size sample" on your business letterhead.

BLAW-KNOX DIVISION
OF BLAW-KNOX COMPANY
2075 Farmers Bank Bldg., Pittsburgh 22, Pa.

BLAW-KNOX ELECTROFORGED STEEL **GRATING**

Here's one way to judge leather belting quality

Examine the working side of the belt to see that it has a clean, uniform, open grain surface like this:

*Microphoto of Schieren DUXBAK belting

If it does, you can be sure the belting has the *pulley-gripping* capacity to provide maximum producing speed and power.

With Schieren DUXBAK leather belting the surface which provide this glove-like "grip" is achieved by an exclusive scouring process that assures maximum coefficient of friction. Low stretch, extra flexibility and longer service life are some of the other money saving advantages of DUXBAK belting.

Write for further information on leather belting, packings or leather specialties of all types.

CHAS. A. SCHIEREN COMPANY
36 FERRY STREET, NEW YORK 7, N. Y.
60 Front Street, W., Toronto, Ont.

Branch Offices in Chicago, Dallas, Denver, Detroit, Newark, New York, Philadelphia, Pittsburgh, Salt Lake City

Relation Between V-Belt Sag and Belt Length

Relation between sag and belt length is generally misunderstood, leading to an exaggerated idea of the difference in lengths between V-belts on a Multi-V drive, a recent bulletin of The B. F. Goodrich Company says.

The bulletin contains a table given below, showing the differential in length between a belt which is tight and one which sags on the same drive, and says that a careful examination of the figures will surprise most operators of Multi-V drives. The table follows:

(Inches)	10	20	30	40	50	75	100	200	300
½	.063	.037	.025	.010	.008	.004	—	—	—
1	.257	.130	.095	.074	.038	.018	.025	—	—
2	.991	.513	.343	.240	.20	.17	.054	.03	—
3	—	1.08	.78	.59	.44	.30	.12	.06	.035
4	—	—	1.151	1.03	.83	.60	.40	.21	.16
5	—	—	—	1.61	1.27	.87	.66	.37	.29
6	—	—	—	—	1.86	1.25	.94	.42	.35
8	—	—	—	—	—	2.12	1.79	.70	.63
10	—	—	—	—	—	—	2.60	1.32	.96

As an example the bulletin points to the belt on a drive with 50 inch centers which has sagged two inches below a belt on the drive which is tight. The sagging belt, the table shows, is actually only two-tenths of an inch longer than the tight belt. This increased length increment decreases as the center distance increases, the table shows.

The bulletin says that there are often reports of a belt which is "four or five inches" longer than other belts, but these are usually exaggerations based on the misunderstanding of the sag and belt length.

Rather wide variation in belt lengths on ordinary drives do not produce unsatisfactory operations, the bulletin declares, but also recommends that best performances can be obtained from matched sets of belts, the maximum variation in length of those which the company makes in any single set being less than .6 inches.

EFFECT OF TROPICAL CLIMATES ON MATERIALS REPORTED

American wartime research for the prevention of deterioration of optical instruments, textiles, synthetic resins, plastics, photographic equipment and other material in tropical climates is summarized in a report now on sale by the Office of Technical Services of the Department of Commerce.

The report explains that in tropical climates, equipment and supplies are exposed to heavy rainfall and high relative humidity. These factors alone affect the performance and serviceability of instruments and in addition furnish ideal conditions for the growth of microorganisms which collectively attack a wide range of basic materials.

The report summarizes results of tests on flying clothing, airplane fabrics, fruit bars, shoes, stitched leather, filter papers, sheet insulating materials, plastic terminal strips, gas masks, cotton fabrics, paper pads, bridged and steel panels of strippable coating, ear wardens, neoprene earphone sockets, spray coatings, cork samples, glass cord plastics, hookup wires, lenses, felt, and other materials.

An analysis of the problems, the scope of the research, test methods, and comprehensive discussions of problems connected with resins, photographic equipment, electronic equipment, textiles, and optical instruments are included.

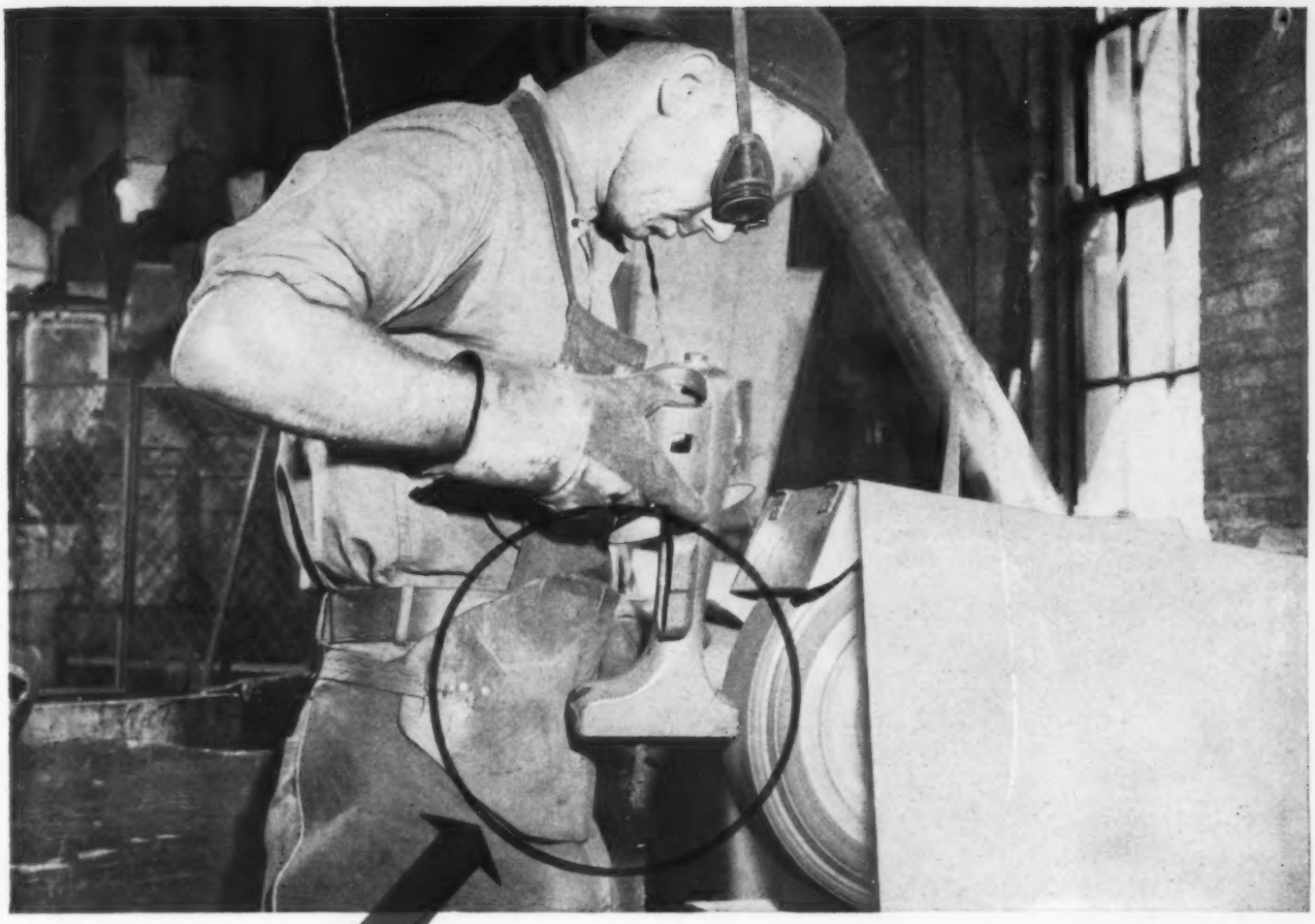
Orders for the summary report (PB-81801; Tropical deterioration of equipment and materials; 91 pages mimeographed, $3.50) should be addressed to the Office of Technical Services, Department of Commerce, Washington 25, D.C., and should be accompanied by check or money order, payable to the Treasurer of the United States.

IDLE SURPLUS IS IDLE CAPITAL! CONVERT IT TO CASH . . . LIST YOUR COMPANY'S SURPLUS IN PURCHASING'S CLASSIFIED SECTION NEXT MONTH

SEE PAGE 334

NUCLEAR POWER UTILIZATION

Some predictions for nuclear power are termed "fantastic" and "exaggerated" by E. E. Johnson, manager of engineering of General Electric's Apparatus Department. Mr. Johnson said that one of the most important things to consider is that applications to be used near human beings must have a very heavy shield. This rules out use in automobiles, aircraft, and even locomotives, he said, explaining that the two most likely developments in the constructive use of atomic power will be larger land power plants and ship propulsion plants. Use in naval vessels was foreseen in view of the fact that enough lightweight fuel could be carried to drive a ship several times around the world at full speed. In any case, Mr. Johnson said, nuclear fuel must compete with coal and oil on a cost basis.



Production time cut 74%!

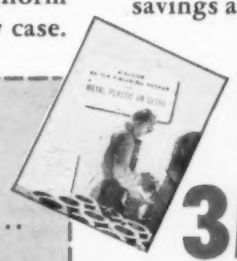
This sewing machine manufacturer formerly used hand filing to remove flash on sewing machine arms and beds. Switching to floor backstands with segment face contact wheels and 3M Abrasive Cloth Belts cut production time on each arm and bed from 12 minutes to 3 minutes, 5 seconds.

This method makes production-line grinding and polishing possible on a wider range of surfaces than ever before, producing uniform finishes at a lower cost per unit in every case.

3M ABRASIVE BACKSTAND BELTS CAN HELP *YOU* REDUCE COSTS

More and more manufacturers are switching to 3M Backstand Belts because of their faster cutting and smoother finishes—regardless of whether surfaces to be finished are curved or flat! Lowered production time, increased output, and fewer rejections are combined with long, economical belt life to produce new savings and a new quality of output.

Further information can be had from your local jobber, or use the coupon below for your free copy of our booklet explaining the 3M Backstand Method.



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MINNESOTA MINING & MFG. CO.

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25% SAVE 60% 40%

by replacing screw machined parts with Milford's

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Our files bulge with case histories which prove that MILFORD COLD HEAD SPECIALTIES can effect extraordinary savings. That's because MILFORD equipment and MILFORD experience are among the finest in the industry.

CUT YOUR COSTS NOW

Send sample part or fastener with information. Our Engineers will do the rest. No obligation.

Investigate

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2. Rivets
3. Engineering Consultation

MILFORD RIV-ET & MACHINE COMPANY

1000 MERWIN ROAD, MILFORD, CONN

1000 WEST RIVER ST., ELYRIA, OHIO

Standard of Quality

(*Continued from page* 143)

central agency which will test the product and report back to him at a nominal fee, or this function can be performed by a central purchasing agency. In the institutional field we must find ways and means to regularly check test our products if quality is to be maintained at a high level.

There is no royal road to quality control. The hospital buyer, because of the scope of his work and the technical and scientific nature of many of the products he is regularly purchasing, has a greater responsibility and must be better prepared for his job than buyers in many other fields. Finding ways to reduce hospital operating costs is a major problem for management today. The cost of supplies and equipment has risen tremendously in the last year and a half. More than ever before, purchasing products of known high quality that will give maximum serviceability and reduce waste, and reducing inventories by the elimination of unnecessary types and varieties will go far toward offsetting higher costs for supplies and equipment in many institutions.

Precision ROD CUTTING at High Speed

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This newest member of the DI-ACRO "DIE-LESS DUPLICATING" family of Machines brings you accuracy, speed, capacity range and ease of operation fully up to standards of DI-ACRO Benders, Brakes, Shears.

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Service and Savings For the Taxpayer

(*Continued from page 92*)

the use of the revolving fund would it be possible to take advantage of the offerings.

The State also has been able to acquire large quantities of apples, potatoes, and vegetables of all kinds on a donation basis. All of this has been of great benefit to the Commonwealth. The details are all handled by the State Purchasing Agent.

Centralization of the purchasing responsibility for these diverse agencies of government has proved its worth in many ways. The example of boats for the Nautical Training School was cited earlier in this article. Let's go a little farther into this same item. The Purchasing Bureau buys boats for the Metropolitan District Commission, in connection with the control of rivers and reservoirs; it buys crash boats for the airport, which is located on the waterfront; it buys boats for Conservation in order to track down violators of the fish and game laws. It would be ridiculous if each department were to purchase a boat. They would buy from different people, they would have little idea of comparative values, or of sources of supply.

The same thing applies, of course, to purchases of food and other supplies. Beef is bought on a specification which is the same for everybody. Coal is bought to meet the needs of the particular institution, but it is bought on specification, and samples of the deliveries are checked. Flour is standardized; so is coffee, and all of the grocery items. If the Commonwealth did not have a centralized purchasing system, there would be many kinds and varieties of beef being bought, and many kinds of coal and flour. Each one would have a different standard and would be paying a higher price.

A professional buyer is better able to purchase at the correct time and in the right amounts, than a steward who is concerned with running the general business activities of an institution. A centralized purchasing system is concerned wth just one fundamental responsibility—buy the right quality, in the right quantity, at the right time, and at the right price. That is the reason why the Commonwealth established the State Purchasing Bureau.

The law requires competitive bidding, and that has always been the policy of the Bureau. The basis upon

(*Please turn to page 316*)

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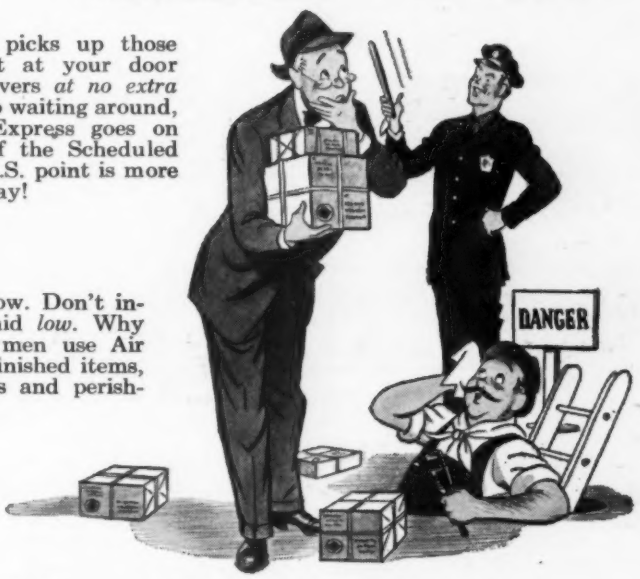
"Air Express picks up those packages right at your door here, and delivers *at no extra cost*. There's no waiting around, because Air Express goes on every flight of the Scheduled Airlines. No U.S. point is more than hours away!

"And rates are low. Don't interrupt me—I said *low*. Why else do business men use Air Express to ship finished items, replacement parts and perishables *regularly*?"



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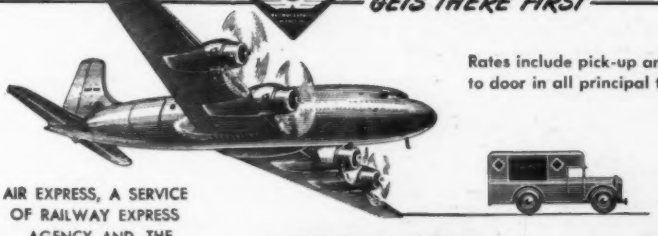

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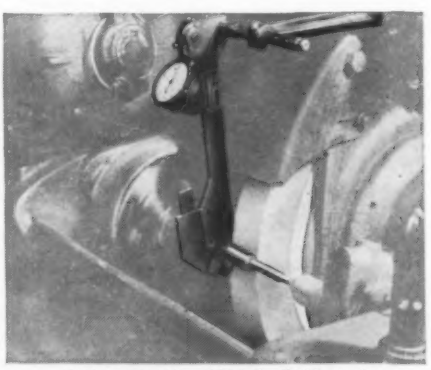

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Service and Savings for the Taxpayer

(*Continued from page* 315)

which purchase awards are made can be summed up very simply—to buy what is best for the Commonwealth. A central purchasing agency, so far as Massachusetts is concerned, is of real service to the taxpayer, and it saves him money.

* * *

Science and the Layman

(*Continued from page* 124)

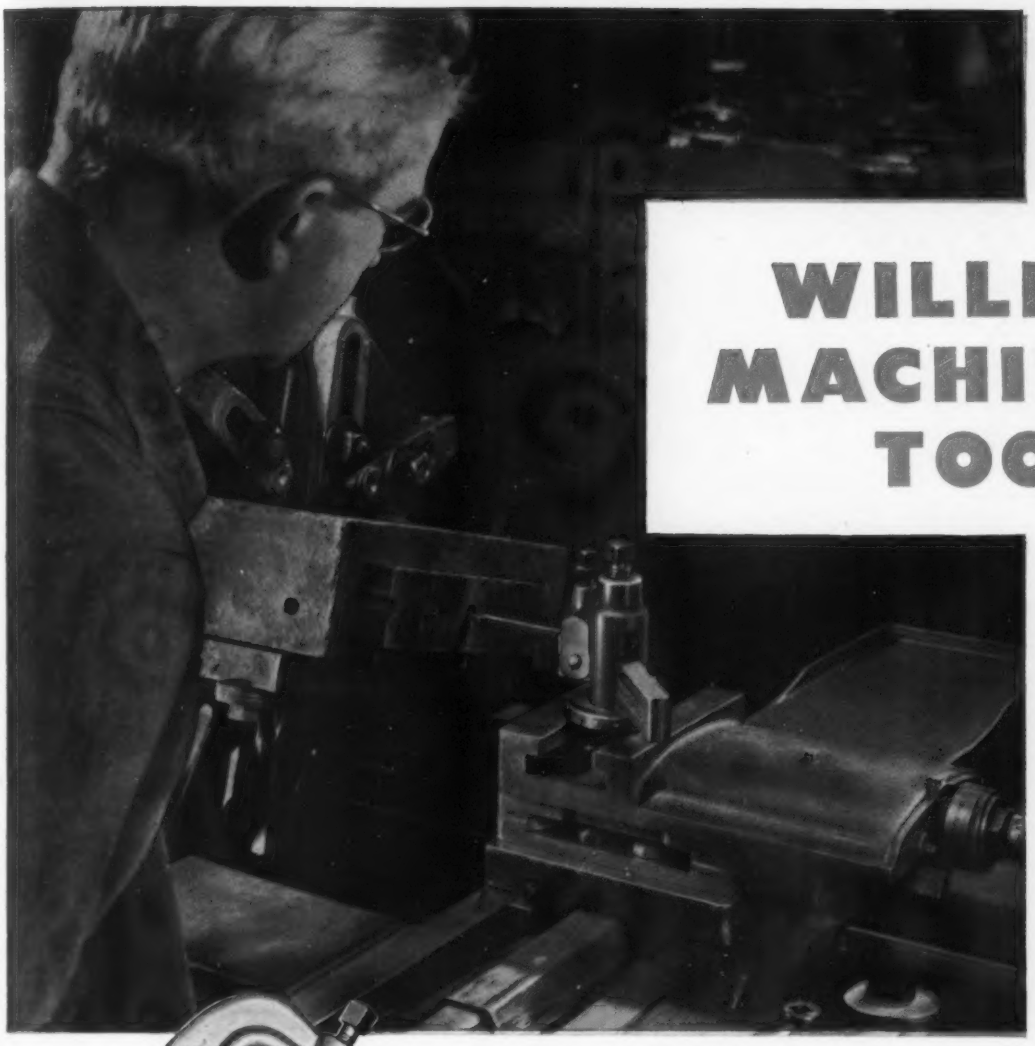
allegedly mysterious precincts of the laboratory and, discarding the jargon which they seem to have created for their own convenience, they tell their non-scientific audience, in easily understandable language, something about their scientific activities, their discoveries and their application. Several such books and articles have done much to dispel the notion of magic and miracles in science—the old view of scientific explorations as ventures in a sort of black art denied to ordinary laymen.

One of the best such books in the writer's judgment, is Dr. James B. Conant's "On Understanding Science—An Historical Approach" (146 pp., Yale University Press, New Haven, 1947). Dr. Conant believes that it is desirable that all business men should have some degree of understanding of science and its application to modern life. He says: "If a business man understands the historic relation of science and the arts, he has a solid basis for forming opinions." Any thesis that suggests a successful method of acquiring a solid basis for forming opinions, deserves the close attention of every business man.

The book is a prelude to a course of study Dr. Conant himself is conducting for students who are not, and do not intend to become scientists. He hopes to equip them as laymen who will enter business and industry with an understanding of the scientific mind, and the slow progressive stages by which, even now, science advances. A careful reading of this book hammers home the lesson that only by following a program of fundamental research aimed at increasing knowledge, even for the sake of knowledge alone, will modern man find the cures for disease and the easier, peaceful, better living that the fruits of science can make possible.

Wholly new concepts of human

(*Please turn to page* 318)



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Science and the Layman

(*Continued from page* 316)

life will follow in the wake of this new knowledge. The profoundly revolutionary changes already affected by nuclear fission will almost certainly be followed by hosts of other changes requiring deep and far-reaching adjustments in the society of man; socially, economically, politically and in every other way.

Aside from a most interesting presentation of its subject, "On Understanding Science" is a book that will initiate the average non-scientific reader in a salutary mental discipline. It will make him *think* rather than feel. It is a late day to argue that in America, education is the right of everyone; but like most things that have become familiar, we frequently forget that real knowledge is a possession of a minority. Our new obligations, as scientifically-literate citizens demand that we broaden our horizons. Dr. Conant's book is a pleasant introduction to that task.

* * *

Army-Navy Air Force Unification Act

(*Continued from page* 134)

lieved that further progress during 1948 will see the elimination of all duplicating purchasing offices.

The Quartermaster Corps has set an example in single Service procurement of which it can justly be proud. The purchase of foodstuffs for all the Services is a tremendous and difficult task which the Quartermaster Corps of the Army has performed with distinction, both in war and in peace. This method of food procurement was found to be essential in time of war, and is proving to be advantageous in time of peace. What we have found to be good for food must be good for other commodities. One important task of the Armed Services is to set up in time of peace organizations and procedures that can rapidly be expanded without significant change in the event of an emergency. Both the Army and Navy, with the Munitions Board, have been working toward that objective.

Uniform Purchasing Laws

Under the new arrangement, the purchasing regulations for all Services will be uniform. The Army has practically returned to the formal, competitive bid system except for

the purchase of perishables.

The Army—Navy—Air Force and Coast Guard have requested Congress to change the old laws so as to provide some greater flexibility in time of emergency. The change is incorporated in House of Representatives Bill No. 1366, passed by the House, and now before the Senate.

The major changes embodied in this legislation, away from the old, rigid competitive bid system, are:

1. Increases the amount which can be purchased from $500 to $1,000.
2. Not necessary to advertise if supplies are purchased outside of the U. S. and its possessions.
3. Exempts medicines and medical supplies from advertising.
4. Exempts all perishable foods.
5. Exempts if impossible to obtain competition.
6. Permits rejection of bids if identical appears to be collusive or if not reasonable, but provides that advice of such rejection and intention to negotiate rather than re-bid shall be given to each bidder. The negotiated price must be lower than the lowest bid price.
7. Exempts from bidding certain technical equipment and parts for such equipment, where standardization is essential in the public interest.

There are other changes pertaining to Educational Orders and orders or contracts for Research and Development.

In other words, the new law (when passed) will provide, for the first time, uniform practices between all of the armed services, and of the Coast Guard. The fact that the new law is approved by the Comptroller General of the United States will be helpful to contracting firms or corporations and purchasing officers alike.

* * *

Effective Unified Procurement

(*Continued from page* 137)

(a) Where lead-time is important and the need is urgent, make award to the lowest acceptable bidder *under the specifications* and report the alternate bid to the Requesting Departments as a basis for revision of the specification for *future* procurement, as basis for a common specification.

(b) Where lead-time is not important and there is no urgency of need, the Requesting Departments to review the alternate bid and determine if it is is acceptable for common use. If such action were then deemed fair to the other bid-

(*Please turn to page* 320)

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Effective Unified Procurement

(*Continued from page* 319)

ders, make the award; otherwise reject all bids and readvertise on basis of a common specification.

The second approach would be through the trade association. A manufacturer who saw a possibility of a common specification, particularly where manufacturing processes could be simplified, or processes used for commercial products adapted without undue strain to the requirements of the National Defense Establishment, would be encouraged to submit his proposal to his trade association, together with estimated differences in costs of production, increased utilization of current practices, machinery or personnel, and other practical details.

The trade association would review such recommendations and, where justified, submit the proposal to the American Standards Association, for reconciliation with industry standards. The American Standards Association was formed in 1918 as the American Engineering Standards Committee and soon headed by Dr. Paul G. Agnew. Later it was expanded into the present organization, which now represents a federation of 110 professional, trade and governmental organizations dedicated to the development of standards throughout the industry. Vice Admiral George F. Hussey, Jr., U. S. Navy (retired), Chief of the Bureau of Ordnance of the Navy Dept. during the war, will shortly succeed Dr. Agnew as chairman of this Association.

In January, 1948, the Joint Congressional Subcommittee on Housing, headed by Senator Ralph E. Flanders of Vermont, stressed the imperative need for model building ordinances to guide towns and cities in bringing up to date their present outnumbered codes, and particularly in reducing the cost of construction by standardization of sizes. The report further stated that every effort should be made to apply existing knowledge of standardization and to expand such knowledge, and that Congressional encouragement should be extended to standardization equally to the encouragement of prefabrication and large-scale production.

Some of these proposals would be voted down in the trade association. Others, perhaps, would be found inadvisable on review by the American Standards Association. But some might be approved by the trade association and be found acceptable by the American Standards Association. Such of these proposals as were

(*Please turn to page* 324)

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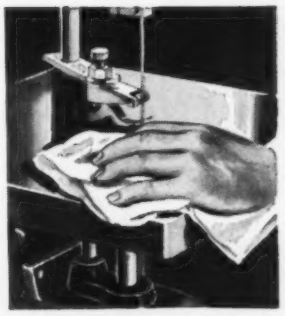

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• Here's a sensational grinding wheel . . . it's the startling, shining SILVER BOND, engineered for super-swift performance, unprecedented efficiency in grinding and finishing; kept constantly FRESH by a protective metallic film! Try it yourself! Stronger than words is the proof you will see for yourself, in your own plant, that the new SILVER BOND is the wheel you can't afford to pass by, the wheel that solves your grinding problems. Tell us the kind of job you have. We'll send a test SILVER BOND promptly.

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Dept. PG, Chicago 7, Ill.

☐ Send Test Wheel for use on .....
☐ Send catalog of complete line

Name .....

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Effective Unified Procurement

(*Continued from page 320*)

cleared in this manner should find a ready hearing in the Army, the Navy, and the Air Force, and once a pattern had been established, there should be ready interchange of data. These efforts would fit into the pattern set by the National Security Council.

It is conceded that this proposal may not be complete; undoubtedly there are plenty of "bugs" in it. But as I studied the intent of the National Defense Act and the directives of the Secretary of the Navy, and read the various statements concerning consolidation of procurement, I tried to draw from my experience how such substantial savings could be realized. I wondered whether "Mr. Big" might not already be too big, and whether these benefits could be attained merely through Centralized Purchasing without considering all of the implications of Centralized Control of Purchasing.

Then it seemed to me that the real and vital element had been overlooked in some measure, that of the "common specification". The way which has been pointed out in the instructions thus far issued to me seemed very rugged and weary. I know of no more thankless job for a Purchasing Officer than to try to reconcile conflicting technical and practical requirements into a common specification. But if substantial savings are to be realized, and the most value obtained from the tax dollar, it seemed clear to me that it would not be through Centralized Purchasing but through Centralized Control of Purchasing.

A recent news release stressed that unified armed forces savings will not offset rising costs, and only minor economies can be expected in the field of procurement. This confirmed my conclusion and forms the basis agreed that a common specification is for this discussion. Everyone is a desirable and laudable objective; all will agree in principle. It is only when this principle is applied to a product in which they are interested, will that dissent be found. By providing an avenue for common appraisal of the elements making up a common specification; by securing the review, first of an individual producer, then of the trade association, and finally the American Standards Association, it seemed to me that a real bridge would be formed across which the Requesting Departments might walk, hand in hand, to the Army-Navy Joint Specification Board, and deliver a package all tied up with ribbon, ready for approval.

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- IT'S COOL RUNNING
- IT'S ECONOMICAL TO OPERATE

Selecting a power unit for especially designed machinery or for standard equipment is not a difficult task when you consider that VALLEY MOTORS are built to meet *any* design demand.

Furthermore, you have the added assurance of dependability because of the nation-wide acceptance by machinery manufacturers in all industries who have used VALLEY MOTORS for many years.

Why Not Check Into VALLEY Features

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Announcing
TRIAD PRD
For Faster, Easier Spray Booth Maintenance

To assist you in lowering your spray booth maintenance cost, Detrex Corporation announces its new development—Triad PRD.

Triad PRD is a coating material used on the side walls of both wet and dry spray booths for protection against paint overspray.

It may be applied by brush or spray gun without fire or health hazard. It dries to a dustless, white film.

The PRD coating and overspray are easily scraped off without previous soaking; and paint adhering in a solid film can be peeled off in sheets. The walls are also readily cleaned by hosing with hot or cold water.

Detrex paint deflocculants are also available to you for conditioning paint overspray in water-wash booths. Write for full details on Detrex cost-reducing spray booth compounds.

Degreasers • Solvents • Spray Washers Alkali and Emulsion Cleaners • Processing Equipment

A 2.48

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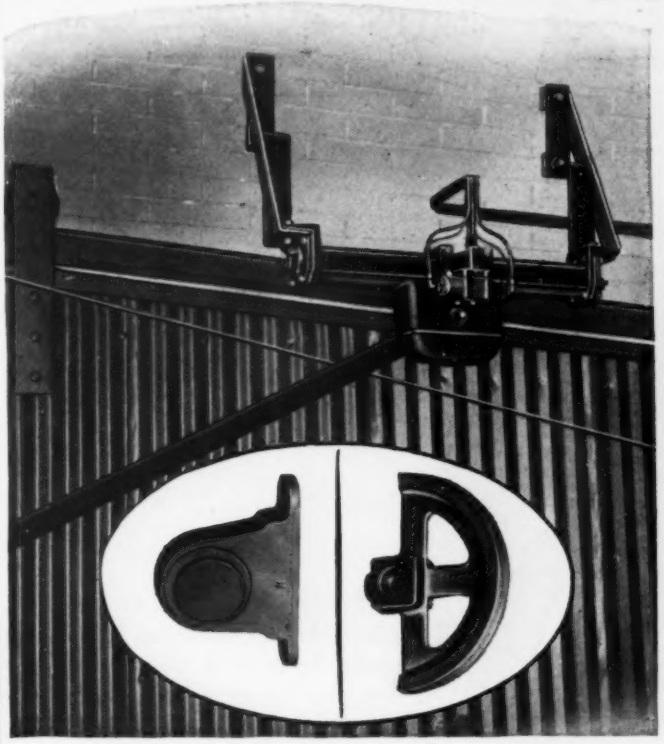
DETROIT 32, MICH.

Pneumatic Door Operating Equipment MUST STAND UP



The National Pneumatic Company originated and developed door operating and control equipment that is recognized as standard throughout the entire transit industry. Their doors are installed also in many factories, public buildings, arsenals, etc.

Our forgings have been chosen for the valve blocks and segment gears. The dies for these important parts—as for all National forgings—are so designed that the fibre-like flow line structure is concentrated at points of greatest shock and stress.

Forgings are being used for more and more products because they provide unparalleled toughness, tremendous fatigue resistance, and maximum strength.

Write today for booklets and send us inquiries for custom drop forgings.

National forgings carry the trade mark "N"—your guarantee of Fine Quality Forgings.

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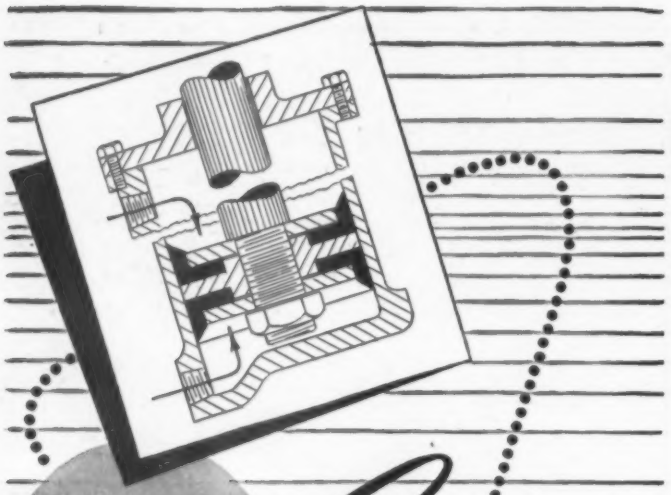
DROP FORGING DIVISION
NEWARK 5 NEW JERSEY



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For many types of component parts that must have top precision, Acadia Synthetics offer extra advantages: They meet and resist difficult operating conditions including heat, moisture, oil pressure, age, wear, etc.

Acadia Synthetic Rubber can be molded, die-cut or extruded in any shape, size and form . . . and compounded to meet specific conditions.

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There's a precision-accurate Detecto Scale for your specific weighing and counting need. The Detecto helps increase production, yet assures you maximum accuracy by making slightest weight discrepancies immediately visible.

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Another Detecto-Gram Scale for weighing your ingredients accurately. New Model #8800 brings to your heavy duty weighing jobs the mechanical accuracy previously found only in small scales. Capacity ¼ ounce to 60 lbs.

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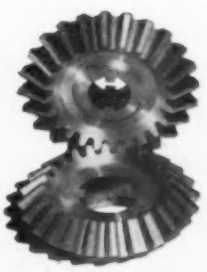

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Riveting with Chicago Automatic Rivet-Setters is a fast, inexpensive way to fasten metal to metal, wood to wood, leather to leather, fabric to fabric, plastic to plastic, or any combination of these. Chicago Rivet engineers have the experience of 26 years to help you with your hard fastening problems.

Free FASTENING CLINIC

Send us a drawing or unfastened sample or sub-assembly of your product. We will gladly analyze your fastening needs, recommend the type of rivet and Chicago Automatic Rivet-Setter to do the job best, and submit estimated production rates. No obligation.

Model 121
Chicago Automatic Rivet-Setter

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9607 W. Jackson Blvd., Bellwood, Ill. *(Chicago Suburb)*
Automatic Rivet-Setters • Tubular and Split Rivets in all Rivet Metals C-1

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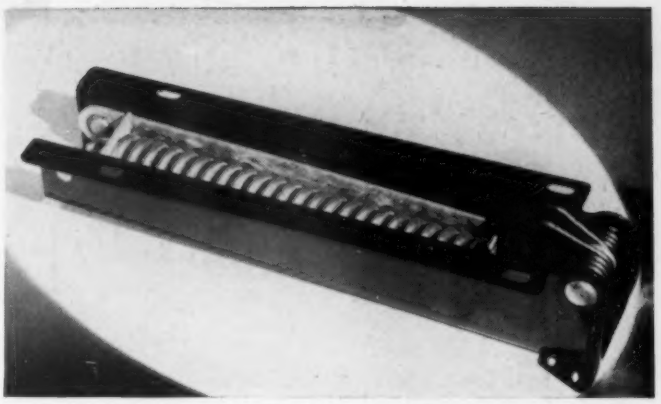
SPECIFY HODELL FOR QUALITY CHAIN

For 60 years Hodell has built dependability into every link of 157 varieties of welded and weldless chain. Throughout America, for every chain job, industry specifies Hodell . . . *to be sure.*

ESTABLISHED 1886
THE HODELL CHAIN CO.
CLEVELAND 3, OHIO



● Spring for hinge lid of freezer unit (another typical Reliable Spring application).

The Small Quantity SPRING User also gets RELIABLE'S TOP SERVICE

Reliable

One of the principles on which this company was founded was good service to the small user. If you order springs in limited quantities, in short production runs, remember that Reliable is exceptionally well set up and equipped to handle that kind of order, and give it the same fine service as any other order. You will receive the same expert attention, the same uniform high quality.

Our plant is designed to handle limited production runs with efficiency and economy. We have a high relative proportion of skilled operators compared to number of machines. We never hesitate to put our very best men on these small orders. For dependable quality and prompt service on any size order of springs, wire forms, or light stampings—call on Reliable.

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ROUND AND FLAT WIRE SPRINGS · CLIPS · HOOKS · BENDS · LIGHT STAMPINGS

How many Uses in your Plant for this NEW 3 in 1 TOOL?

COFFING Hoist-Jack

Wherever you have a hoisting, jacking, or pulling job to be done, the new Coffing Hoist-Jack helps you do it safer, easier, and faster! *Safer*—because its handle bends at overload point, before any part of hoist can give. Non-skid ratchet and pawl construction prevents load-slip; avoids accidents. *Easier*—because anyone can raise 2,000 pounds with *less* effort. And it weighs only 23 pounds! *Faster*—because it works smoothly, can be set up in a few seconds. Use with stand as a jack; without stand as a hoist or puller. Tested to 100% over rated capacity; proven by thousands of satisfied users for:

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Write for Bulletin PHJ-1

New "Mighty Midget" Puller belongs in your plant, too!

Here's a 6½-lb. puller that handles 500 pounds with only 28 pounds of effort! One man does the work of several in pulling and lifting on maintenance or production jobs. "Safety-load" handle serves as lever or high-speed crank. Ask for Bulletin PMP-1.

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Safety-pull Hoists • Electric Hoists
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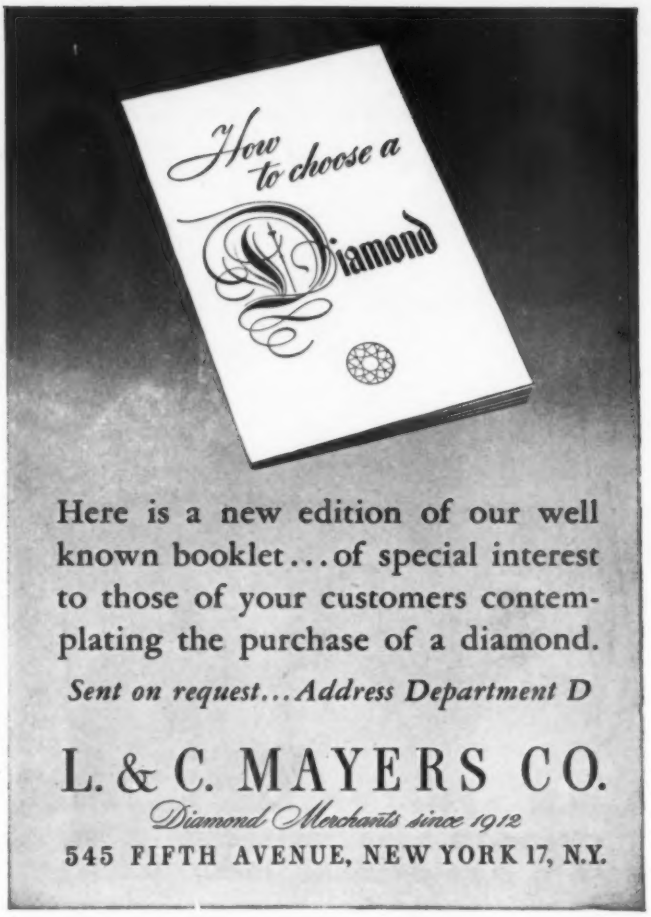
COFFING HOIST COMPANY

DANVILLE, ILLINOIS



Here is a new edition of our well known booklet... of special interest to those of your customers contemplating the purchase of a diamond.

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All over America shippers know Orange Core sealing tape. They like its speedier, stickier, sturdier quality . . . the way it steps up production and protects shipments. Orange Core will do a better job for you.
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You would be surprised at the thousands of dollars that Lewis Spring engineers have saved manufacturers — just by recommending and supplying the most practical and simple spring or wireform for the specific job. Lewis engineers, being familiar with all phases of spring design and manufacture, have a breadth of experience that well qualifies them to judge the spring and wire form type, size and style that will suit the purpose best at the lowest cost.

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THE FINEST LIGHT SPRINGS AND WIREFORMS OF EVERY TYPE AND MATERIAL

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Seamless Steel Plate Made High Pressure
CYLINDERS
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Made to A. P. I. Specifications

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Drop-Forged Steel
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All sizes • All types

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FORGINGS
Made by the steam drop hammer method

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Harrisburg makes its own steel thus assuring prompt delivery

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Established 1853
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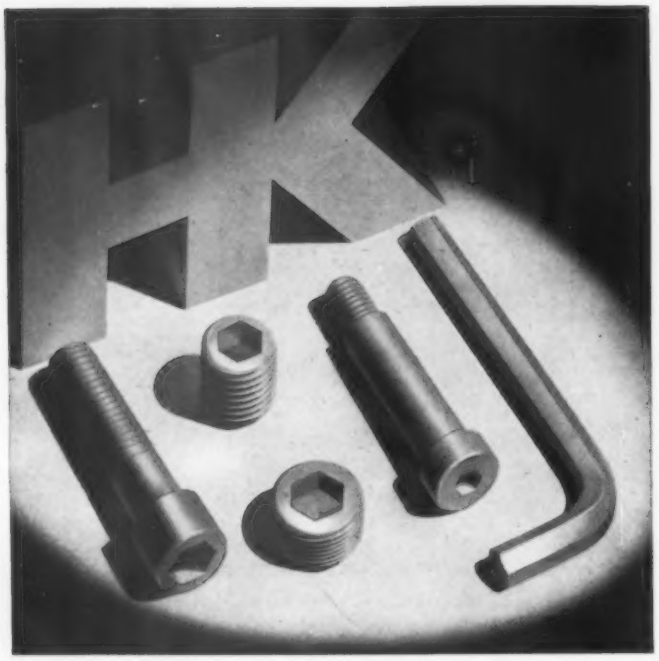

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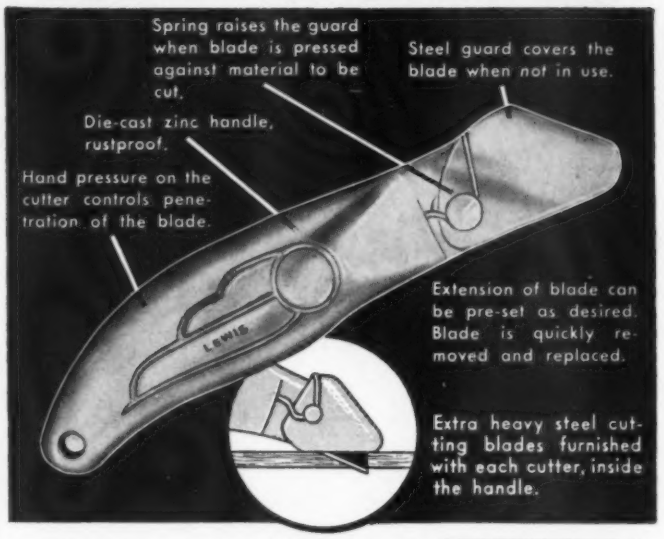
A New Invention . . . Safe . . . Different

LEWIS Automatic SAFETY CUTTER


Spring raises the guard when blade is pressed against material to be cut.
Steel guard covers the blade when not in use.
Die-cast zinc handle, rustproof.
Hand pressure on the cutter controls penetration of the blade.
Extension of blade can be pre-set as desired. Blade is quickly removed and replaced.
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Extra heavy steel cutting blades furnished with each cutter, inside the handle.

Here is a new patented knife that cuts swiftly, surely, safely . . . yet protects the user from injury. Always safe because the blade is guarded — always ready to use because there's nothing to adjust.

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HERE'S an easy way for you to keep abreast of NEW developments in materials, equipment, finishes and processes:

Every month you will find listed in the "Ask Purch" Section — Pages 14 to 20, incl., from 75 to 100 new pieces of manufacturers' literature.

MAKE your selection of the literature of interest to you, and which you may need to bring your catalog files up to date.

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Ask Purch

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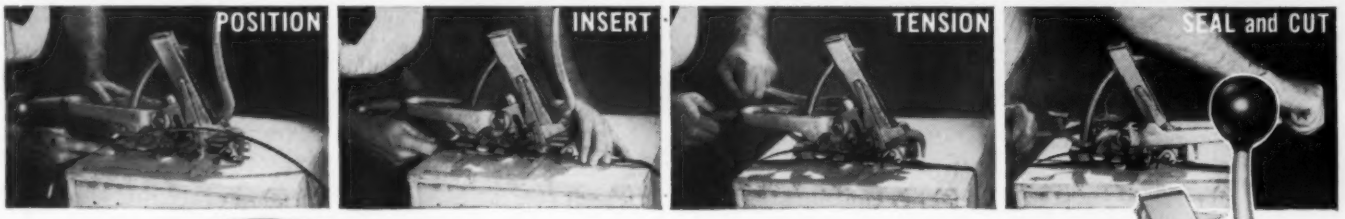
Actually you'd find it impossible to peel the thick, tough coating of zinc from a WITT Can. But, if it could be done, you'd discover that quality is more than skin deep.

Heavy gauge steel, specially selected for greatest possible strength, is formed into extra deep, *rolling* corrugations which bounce off abuse. Lock seams are electrically welded . . . shock-absorbing steel bands protect the vital bottom seam and hold the top in shape. Strong handles are securely fastened on Can and lid. Then the Can is hand-dipped, hot-galvanized . . . filling every crack and crevice, stopping rust before it can start. WITT Can users agree these fine cans are quality throughout, under the skin and including the skin.

Get the best Can on the market. Place your order with your supplier now.

Witt Cans

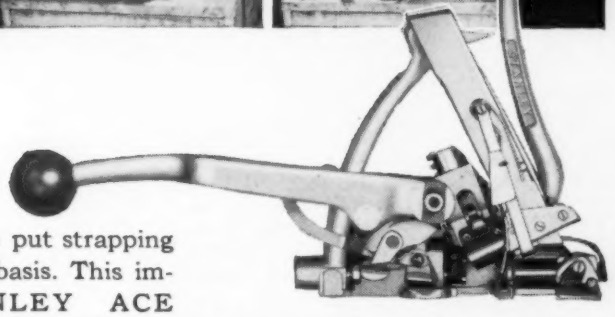
THE WITT CORNICE COMPANY
CINCINNATI 14, OHIO
"ORIGINATORS OF THE CORRUGATED CAN"



4 STEPS 5 SECONDS

with the Improved

STANLEY ACE STRAPPING TOOL



● Here's how to put strapping on a production basis. This improved STANLEY ACE STRAPPING TOOL is light — fast — simple — even a beginner can make time with it. Magazine holds 75-100 seals — is easily loaded and seals in any position. The "Ace" is made in three different sizes, to handle $\frac{3}{8}$", $\frac{1}{2}$" and $\frac{5}{8}$" strapping.

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ELECTRIC TOOLS

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The Stanley Works, *Steel Strapping Division*
144 Lake Street, New Britain, Conn.

Gentlemen: Please send me free folder on the Improved ACE Strapping Tool.

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LETTERS . . .

POST OFFICE SAYS NO

For the past few months, I have noticed that PURCHASING has incorporated a feature called "Purchasing Reports on Purchasing Opinion." This insert sheet very graphically describes your surveys on existing conditions.

As I like to circulate that particular sheet among various members of the concern feeling it to be of great importance and untold benefit to me, I wonder if it would be practical to have that particular sheet perforated approximately ¼" from the binding to permit easy removal from the magazine.

This perforation would permit me to remove the one sheet without destroying any of the rest of the magazine which I keep in my library for future reference.

H. Berger, Pur. Agt.
Hill-Shaw Company
Chicago 6, Illinois

This excellent suggestion would be acted upon were it not for the fact that postal regulations forbid publications mailed at second-class rates to perforate or score more than half the area of any page. Try a razor blade close to the binding edge. If a slip sheet is inserted under the page to be removed, the operation can be done quickly and without mutilating the rest of the magazine.—Ed.

BALANCE

Your November issue contained less articles of interest than usual.

J. L. Hall, Pur. Agt.
G. F. Heublein & Bros.
Hartford 1, Conn.

November was a good number—better than usual.

N. Ebersole
American Rolling Mill Co.
Middletown, Ohio

Every so often PURCHASING asks a cross section of readers to evaluate the contents of an issue. Messrs. Hall and Ebersole were members of the "jury" that weighed the merits of the November issue. The six winners were:

	Reader Rating
"Purchasing Profits Through Inventory Control," page 106	85%
"When May a Purchaser Successfully Contest Validity of a Contract," p. 143	82%
"Firm Prices," p. 111	77%
"Purchasing Reports on Purchasing Opinion — How New Freight Rates Affect Purchasing Policies," p. 79	77%
"Purchasing Schedule Tied in with Production and Materials Control," p. 120	76%
"The P.A. and the Balance Sheet," p. 89	76%

—Ed.

TREND AWAY FROM CASH DISCOUNTS MAY REVERSE

The survey and opinions expressed on the subject of cash discounts is very interesting ("What's the Trend on Cash Discounts?, Purchasing Reports on Purchasing Opinion," page 97, December issue).

It would seem that cash discounts might be considered as trade customs which originally were intended to constitute a financing device. Doubtless the varying rates of discounts were originally expected not only to improve collections and reduce credit hazards but also to augment the seller's cash on hand. Likewise, the cash discount represented to the buyer a higher rate of earning than could be expected on other assets, taking into consideration the added cost involved in prompt handling and payment.

With the reducing trend of interest rates over the past few years, however, cash discounts have become price factors and it is easy to understand why sellers would wish to minimize or eliminate them. Additional working capital can be borrowed so much more cheaply than it can be made available by a more rapid turnover of receivables. Of course, a reduction or elimination of the cash discount is a price increase under present conditions, but may it not be enough of an increase to avoid or lessen the necessity for other price increases? It is incumbent upon purchasing agents to watch and check all prices, particularly as we approach nearer the time when the emphasis will shift from cost to competitive conditions in determining prices.

Although I believe cash discounts are simply another factor to be considered, I see on the other hand no validity in the argument that their elimination would simolify the buyer's invoice handling routine. With suppliers of numerous and frequent billings, it is usually fairly easy to arrange for weekly or semi-monthly settlements. The pressure of discount dates, moreover, constitutes an automatic check on clerical efficiency.

Finally I wonder if the trend toward elimination of the cash discounts may not be reversed as soon as interest rates are increased, credit tightens, and shortages of working capital become more pronounced. Conceivably, the time may come again when quick collections are worth paying for.

James M. Berry, Ass't. Pur. Agt.
Vick Chemical Company
Greensboro, N. C.

SKUCE PLEASED

During the war years there were times when being "Skuced" had different implications from those described in "Pages from a Buyer's Notebook," page 114, December PURCHASING:

> There's a new word in the vocabulary of industrial purchasing. It's the verb 'skucing,' as explained by Bill Roemer of the Bristol Co. (page 107 of same issue, 'Buying the Right Quantity').

There is, however, no difference in objective in either case, which simply consists of developing more efficient production and purchasing methods based on the practical conditions that have to be contended with.

Walter C. Skuce
Owens-Corning Fiberglas Corp.
Toledo 1, Ohio

ORCHID

PURCHASING is without question the most interesting and helpful magazine that is available today.

H. D. Powell, Pur. Agt.
Minnesota Mining & Manufacturing Co.
Saint Paul 6, Minn.

INDEPENDENT PURCHASING AGENCY

It is my intention to start an independent purchasing agency working for small concerns and the general public. I have had years of experience in the handling of building construction materials and some other commodities and any help or advice you could give me I would sincerely appreciate.

—P. O. A.

There is without doubt an opportunity for a highly useful service to be performed by a purchasing agency such as you propose. The greatest difficulty experienced by those in this field is to establish a satisfactory basis for remuneration. A straight commission basis is obviously unsound and undesirable, since the emphasis in such a service is necessarily on the lowering of costs. There is also a tendency to assign to the independent purchasing agency those items which are excessively difficult to buy, and which therefore represent disproportionate effort. The most satisfactory arrangement in buying for business concerns is a combination of (1) a reasonable retainer fee for continuing service, and (2) a very nominal rate of commission on overall purchases, reflecting the volume of business handled. In general, the retainer should cover reasonable overhead of the opration, and the commission should represent a sharing of the anticipated savings through expert purchasing.—Ed.

PLEASE GIVE COMPANY CONNECTION

Among the requests you forwarded us for our Booklet M-1613, listed in the "Free Informative Literature" of your December issue (page 14) was one from:

E. E. Hamerstone, Asst. Buyer
Purchasing Department
Room 318
Trenton 7, New Jersey

We will appreciate your supplying us with the name of Mr. Hamerstone's company, so that we can send him the required literature.

S. G. Cabral, Technical and
Service Publications Dept.
Cincinnati Milling and Grinding Machines, Inc.

Mr. Hamerstone is Assistant Buyer, Division of Purchase and Property, Department of Taxation and Finance, State of New Jersey, State House, Trenton, N. J. As it is general practice among those issuing industrial literature to fill requests only when the inquirer's connection is given, space for this purpose appears on the return free literature card. See page 19—Ed.

CLEVELAND *Top Quality* FASTENERS
bring you the advantages of *specialization*

● Hexagon, Flat, Fillister and Socket Head Cap Screws; Square Head Set Screws; standard and special Milled Studs. Materials used: carbon steels, alloys, non-ferrous.

● From the beginning of our operations 30 years ago our aim has been directed toward making the *best fasteners possible* in a restricted list of types. All our manufacturing facilities and skill today are concentrated on Top Quality *Cap Screws, Set Screws* and *Milled Studs*—with some capacity devoted to parts of special design required by our customers. This specialization is your assurance that Cleveland Fasteners meet the highest standards specified in this field. Write for folder explaining double extrusion process used in Cap Screw production.

Originators of the modern cold-forging method that produces stronger more uniform fasteners by . . .

DOUBLE EXTRUSION the KAUFMAN Process

CLEVELAND *Top Quality* **FASTENERS**

The Cleveland Cap Screw Company

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SPECIALISTS FOR 30 YEARS IN CAP AND SET SCREWS AND MILLED STUDS

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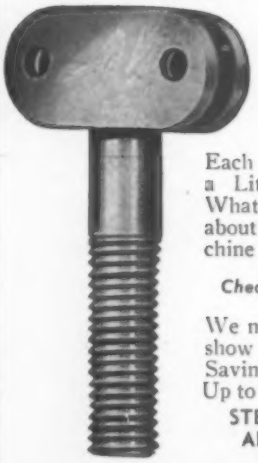

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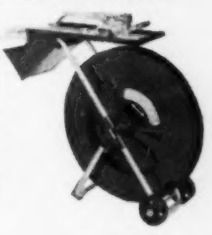

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CHEMICAL USERS' GUIDE To General Chemical Products for the Textile Industry

PRODUCT	AVAILABLE FORMS	COMMERCIAL STRENGTH (MIN.)	SHIPPING CONTAINERS	APPLICATIONS
Glauber's Salt, Crystal $Na_2SO_4 \cdot 10H_2O$ *(Sodium Sulfate)*	Colorless Crystals	96% $Na_2SO_4 \cdot 10H_2O$ 42.3% Na_2SO_4	Bags	Dyeing assistant.
Glauber's Salt, Anhydrous Na_2SO_4 *(Sodium Sulfate)*	White Granules	99.5% Na_2SO_4	Bags	Same as crystal but stronger product.
Sulfuric Acid H_2SO_4	Liquid	66° Be 93.19% H_2SO_4	Carboys Steel Drums Tank Trucks Tank Cars	Carbonizing wool; dyeing; desizing cotton; souring; rayon spinning bath.
Acetic Acid CH_3COOH + water	Colorless Liquid	Various	Carboys Barrels Tank Cars	Dye bath; souring agent; imparting scroop to cotton and silk.
Aqua Ammonia NH_4OH + water *(Ammonia)*	Colorless Liquid	26° Be 29.4% NH_3	Carboys Steel Drums	Wool scouring; dyeing.
Hydrochloric Acid HCl + Water *(Muriatic Acid)*	Liquid	20° Be 31.45% HCl	Carboys Tank Cars Tank Trucks	Souring; removing hypochlorite bleach; dyeing.
Tetrasodium Pyrophosphate, Anhydrous $Na_4P_2O_7$ *(TSPP) (Pyro)*	White Powder	98% $Na_4P_2O_7$ (Equiv. 52% P_2O_5)	Bags	Stabilizing peroxide bleaches; water treatment and dispersing agent; detergent.
Sodium Metasilicate $Na_2SiO_3 \cdot 5H_2O$	White Granules	29.0% Na_2O	Bags Fibre Drums	Kier boiling as detergent.
Sodium Sulfide Na_2S + water	Red Chips or Solid Mass	60% Na_2S	Steel Drums	Dyeing with sulfur dyes; depilatory for wool pulling; desulfuring rayon.
Sodium Sulfite, Anhydrous Na_2SO_3 *(Sulfite)*	White Powder	98.5% Na_2SO_3	Bags Fibre Drums	Rayon manufacturing.
Sodium Bisulfite, Anhydrous $Na_2S_2O_5$ *(ABS) (Sodium Metabisulfite)*	White Powder	97.5% $Na_2S_2O_5$ (Equiv. 65.5% SO_2)	Fibre Drums	Bleaching wool; anti-chlor after bleaching with hypochlorite; rayon manufacturing.
Oxalic Acid $C_2H_2O_4 \cdot 2H_2O$	Colorless Crystals	99.5% $C_2H_2O_4 \cdot 2H_2O$	Fibre Drums	Bleaching; dyeing; for mordanting wool with chrome.
Ferric Sulfate $Fe_2(SO_4)_3$ + water *(Iron Copperas Nitrate)*	Liquid	47° Be 11% Fe	Carboys Barrels	Silk weighting; mordant.
Ferric Nitrate $Fe(NO_3)_3$ + water *(Iron True Nitrate)*	Liquid	43° Be 47° Be 10% Fe 11% Fe	Carboys Barrels	Silk weighting; mordant.

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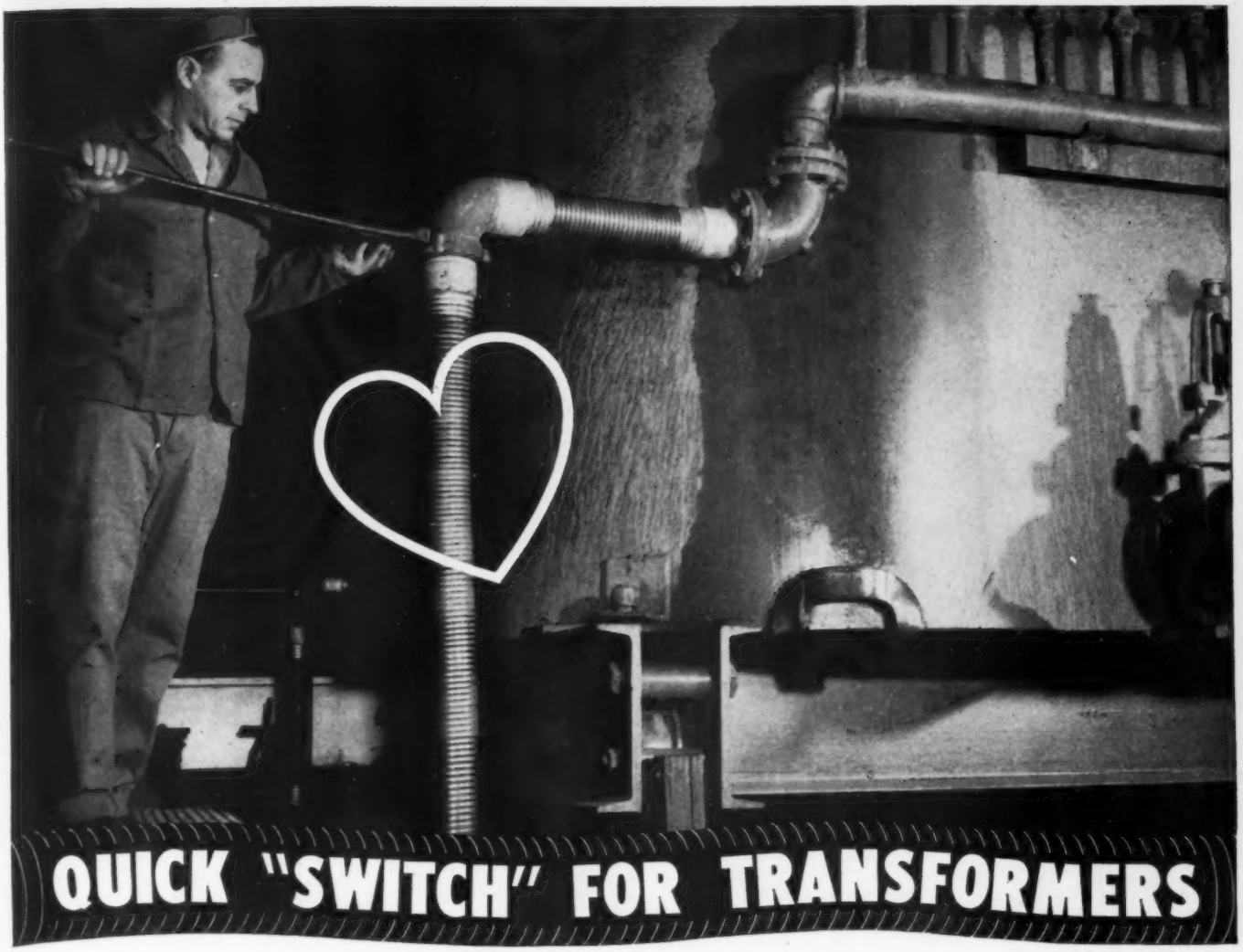

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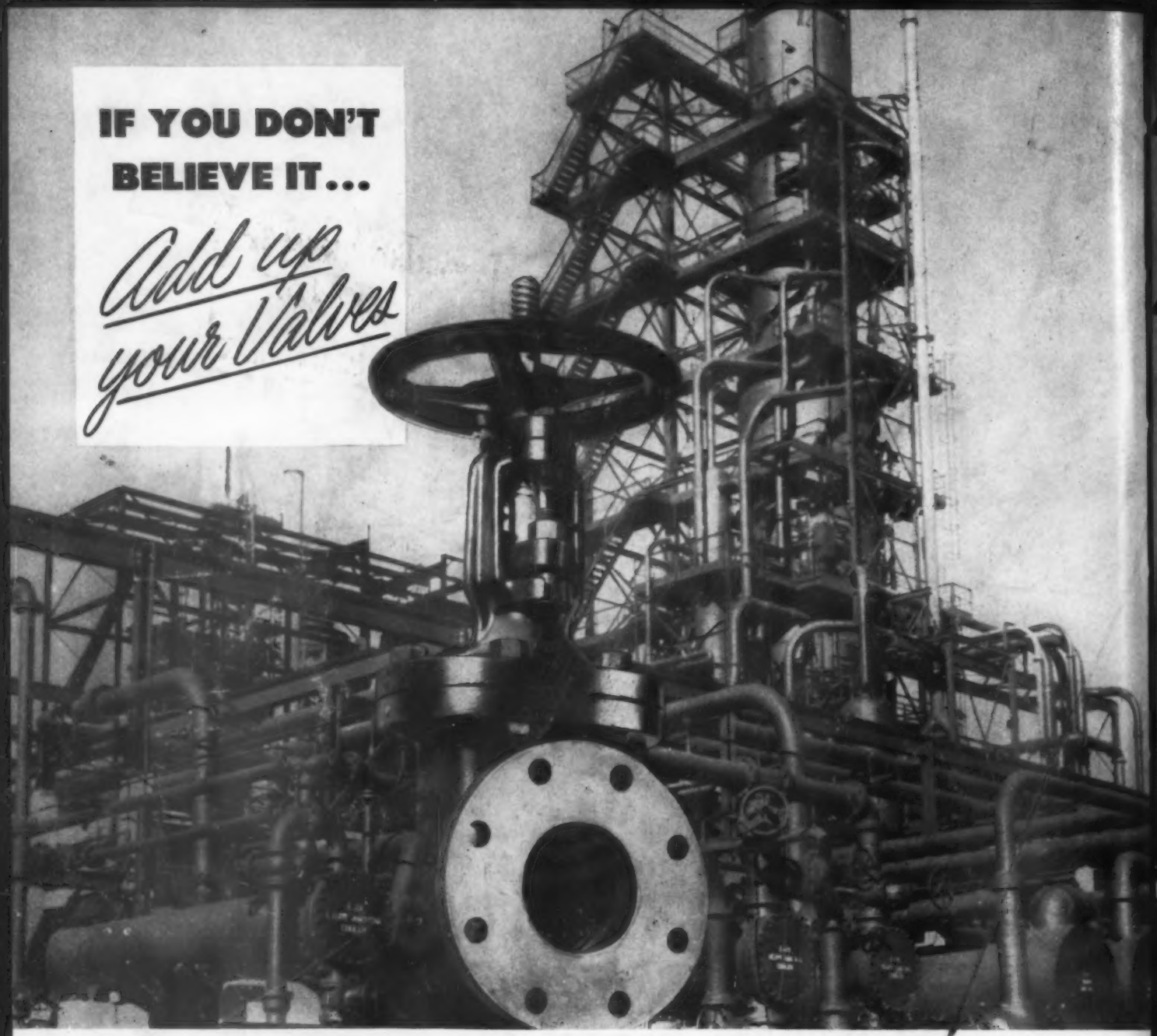

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